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Совет молодых ученых и специалистов

АКТУАЛЬНЫЕ ПРОБЛЕМЫ АГРАРНОЙ НАУКИ, ПРОИЗВОДСТВА И ОБРАЗОВАНИЯ

**МАТЕРИАЛЫ МЕЖДУНАРОДНОЙ ЗАОЧНОЙ
НАУЧНО-ПРАКТИЧЕСКОЙ КОНФЕРЕНЦИИ
МОЛОДЫХ УЧЕНЫХ И СПЕЦИАЛИСТОВ
НА ИНОСТРАННЫХ ЯЗЫКАХ**

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А 43

А43 Актуальные проблемы аграрной науки, производства и образования: материалы международной заочной научно-практической конференции молодых ученых и специалистов на иностранных языках (Россия, Воронеж, апрель 2015 г.) – Воронеж: ФГБОУ ВПО Воронежский ГАУ, 2015. – 408 с.

АКТУАЛЬНЫЕ ПРОБЛЕМЫ АГРАРНОЙ НАУКИ, ПРОИЗВОДСТВА И ОБРАЗОВАНИЯ

Данный сборник содержит статьи участников Международной заочной научно-практической конференции молодых ученых и специалистов на иностранных языках, которая проводилась в апреле 2015 года в Воронежском государственном аграрном университете имени императора Петра I. Рабочие языки конференции – английский, немецкий, французский. В конференции принимали участие молодые ученые из России, Германии, Украины и Франции. Публикация сборника материалов конференции позволяет ознакомить российских и зарубежных коллег с направлениями и результатами исследований молодых ученых и специалистов разных стран и расширить их научные контакты.

URGENT ISSUES OF AGRICULTURAL SCIENCE, PRODUCTION AND EDUCATION

We proudly present collected articles of participants of the International Correspondence Conference on Agricultural Studies and Practical Work that was held in Voronezh State Agricultural University in April 2015. Languages used were English, German, and French. The event welcomed young scientists from Russia, Germany, Ukraine and France. We hope that articles under consideration are to have not only Russian researchers, but their colleagues abroad acquainted with study trends and achievements of young scientists and experts, and enhance their academic contacts.

Редакционная коллегия:

Проф. В.И. Котарев, доц. Н.И. Бухтояров, проф. А.В. Дедов, доц. Ю.В. Некрасов, доц. Л.А. Запорожцева, доц. А.С. Менжулова.

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***Секция I. Инновационные технологии в агрономии,
агрохимии и экологии***

***Section I. Innovative technologies in agronomy,
agro-chemistry and ecology***

УДК 574.4:631.4:656.71

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**THE IMPACT OF AIRCRAFTS ON THE
AGRICULTURAL LANDS ADJACENT TO THE AIRPORT**

Аннотация: в статье рассматривается проблема влияния аэропорта «Воронеж» на прилегающие агроэкосистемы.

Ключевые слова: экология, экологические проблемы, агро-экосистемы, аэропорты.

In modern conditions agroecosystem are constantly experiencing anthropogenic pressures, particularly from vehicles.

The continuous growth of air transport leads to environmental pollution by the products of aviation fuels combustion. On average, one jet, consuming 15 tons of fuel per hour and 625 tons of air releases 46, 8 tons of carbon dioxide, 18 tons of water vapor, 635 kg of carbon monoxide, 635 kg of oxides of nitrogen, 15 kg of sulfur oxides, 2,2 kg of solid particles to the environment. The average duration of these substances in the atmosphere is about 2 years. Most pollution occurs in the area of airports during the landing and takeoff of aircrafts and while warming up their engines. When the engines are on takeoff and landing most of the carbon monoxide and hydrocarbon compounds go to the environment. The maximum amount of nitrogen oxides go to the environment during of flight [5]

The objective is to evaluate the impact of the airport "Voronezh" on the adjacent agroecosystems.

In general techniques of agroecology bookmarks and conducting experiments are used in the experiment [3].

The direct object of the study is agroecosystem located on the sunset on the aircrafts runways of the airport "Voronezh" at a distance of 3 km and 1.5 km. They are on the plakor and slope.

Background portion (control) was located outside the take-off and landing. Area Account plot is 100 m². The studies were conducted in 2013-2014.

Soil is the major abiotic component of the environment. One to its special properties, it plays a crucial role in economic activity, as the principal means of production. Soil conditions largely determine the ecological balance in the system. Important ecosystem function of the soil is that it is an area of living matter concentration (concentration, accumulating function). Are land plants rooted in the soil? It is a home of small animals, a huge mass of microorganisms [2].

Yields of some crop plants often depend on the population density of earthworms. Their significance in natural biocenosis is great. As detritus, they are actively involved in the matter cycle. It should also be noted that earthworms can accumulate in the bodies of radionuclides and heavy metals from the environment and move them into the deeper layers of the soil [4].

The studies give evidence of the fact that the population density of detritus is largely determined by the location of the agroecosystem mainly the distance from the airport (Table 1).

Table 1 – registration of fauna diversity

option	indicators		
	form	Number	Biomass, g
monitoring	May beetle larvae	1	3,6
	earthworms	6	
	millipedes	1	
1 (3 km)	earthworms	27	11,1
2 (1,5 km)	earthworms	1	0,5
3 (on the slope of the ravine)	millipedes	6	0,7

The data in Table 1 allow to judge that the greatest species diversity in spring is marked on the control variant, and the largest number of earthworms - 27 pieces for the first option (3 km from the airport). In the second option (1.5 km to the airport), the number of

lumbricids is 26 pieces lower than in the first option. It proves that the toxicity of gaseous compounds increase when the engines are boosted at landing and the release of fuel.

In determining the composition of the detritus food chain in the summer lumbricids are virtually absent in the upper soil horizon.

Chekanovskaya [6] indicates that the higher the temperature of the soil at the sufficient low humidity, the more intense is metabolism of earthworms, the more is their weight. This is because an increase in the medium temperature leads to the medium temperature rise in earthworms bodies in body and hence the rate of all physical and chemical processes in their cells. Dry spring after a very cold winter causes massive loss of lumbricids.

Soil invertebrates play an important role in the formation of microbial structure and significantly affect the biological activity of the soil [4].

One of the soil biological activity indicators characterizing is ability to maintain homeostasis its enzymatic activity. According to some authors, the catalase activity in soils can serve as an objective indicator of its biological activity [1]. As a result of the experiments, data obtained are presented in Table. 2.

Table 2 - The activity of catalase, O_2 , $cm^3 / g / min$

option	2013	2014
monitoring	4,2	3,2
1 (3 km)	4,0	5,0
2 (1,5 km)	1,93	2,8
3 (on the slope of the ravine)	1,9	1

The results prove that the highest enzyme activity was observed in control and at 3 km distance from the airport (1 option) within 3,2 - 4,2 O_2 , $cm^3 / g / min$, which is higher than the other options located at a distance of 1 5 km (2.2 - 2.3 O_2 $cm^3 / g / min$. higher)

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THE INFLUENCE OF TOPINAMBOUR ON PHYSICO-CHEMICAL PROPERTIES OF LEACHED CHERNOZEM

Аннотация: В работе представлены результаты исследований, полученные в производственном опыте с удобрениями и мелиорантом при выращивании топинамбура. Изучено изменение физико-химических свойств чернозема выщелоченного. Установлено, что выращивание топинамбура приводит к ухудшению физико-химического состава на всех изучаемых вариантах. Однако использование кальцийсодержащего мелиоранта оптимизирует свойства почв.

Ключевые слова: удобрения, мелиорант, топинамбур

High technogenic impact on the soil results in significant change its properties in intensive agricultural production the environments. As a result of mineral fertilizers application soil acidification takes place and hydrolytic and metabolic acidity increases. Long-term usage of land cultivation without compensation of the elements removal results in the reduction of efficient fertility and decalcification, causing change of hydration characteristics and structure of soil aggregates. Reclamation also influences the soil composition and its physico-chemical characteristics [1].

All changes occurring in soil at technogenic impact are mainly associated with soil condition absorbing complex. So actual is the identification of causality between the level of this impact and the soil colloidal complex [2].

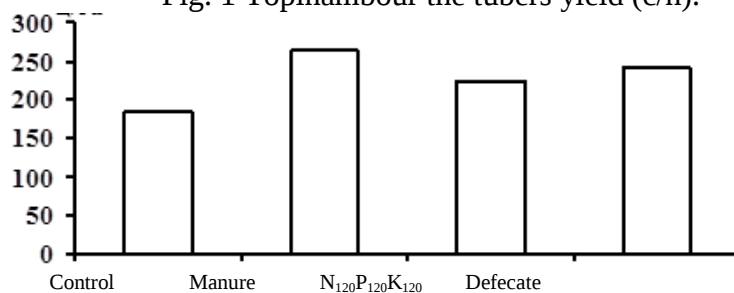
The purpose of the study is to set the influence of mineral fertilizers and calcium meliorant on physico-chemical properties of leached chernozem under topinambour.

As the objects of the study soil samples of layers 0-20 cm and 20-40 cm of leached chernozem under topinambour variety Interest in «TerraInvest» of Dankovsky district of Lipetck region were used. Soil samples were selected before the tubers planting and at the moment of their harvest according to the variants of the experiment. Following were analyzed: absolute control, variant with 20 t/ha of the manure (background), variant with of mineral fertilizers application $N_{120}P_{120}K_{120}$ plus background, variant with calcium meliorant (defecate) use plus background. The humus by Tyurin in modification of Nikitin, the pH water and salt vaticas by potentiometric, the hydrolytic acidity by the standard method with potentiometric end, the sum of exchangeable bases by Kappen, the degree of saturation with bases by calculation method were determined. The account of topinambour tubers yield were conducted by the weight method.

The results of topinambour the tubers yield are presented in Fig. 1 according to the variants of the experiment. It was identified that maxim crop yield is noted on the variant with the use of manure. It is related to the fresh organic matter application and favorable physical soil properties creation variant with calcium meliorant use optimization of physico-chemical soil properties occur. Variant with mineral

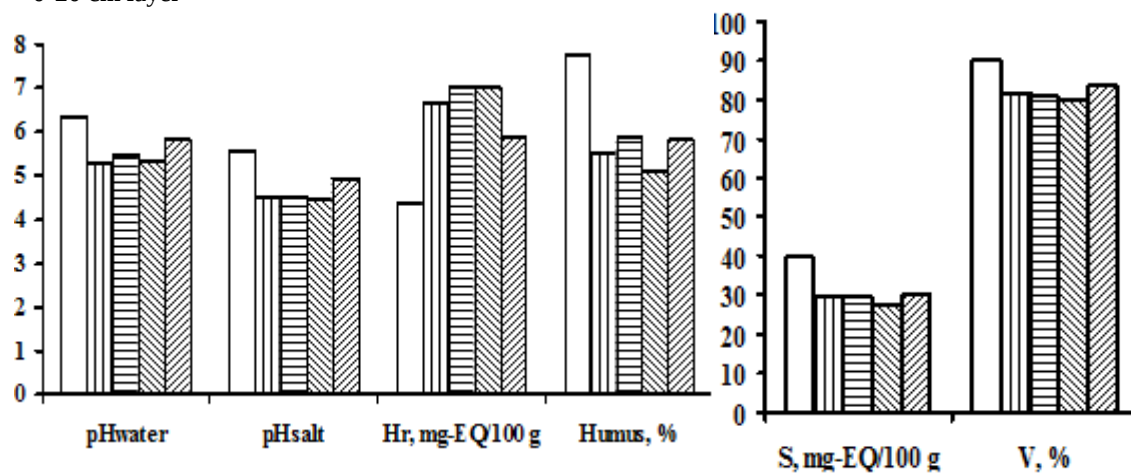
fertilizers use is a bit worse. It is explained by strengthening of vegetable mass damaging to the tubers development.

Fig. 1 Topinambour the tubers yield (c/h).

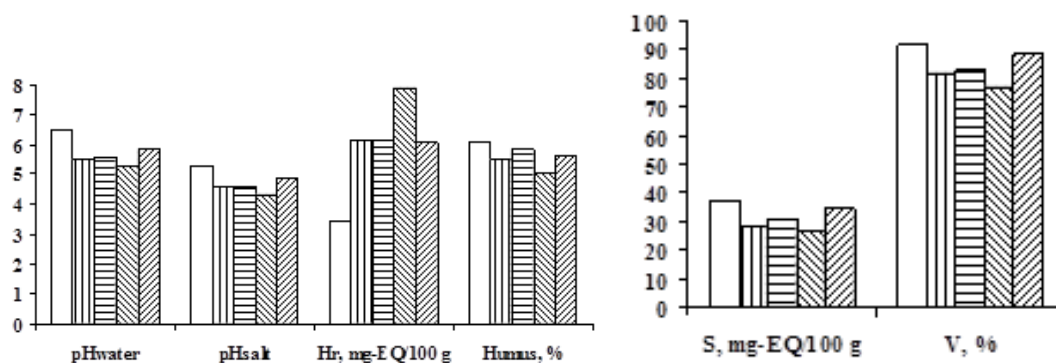


The results physico-chemical soil properties for the changes studied variants are presented in Fig. 2.

Fig. 2 Physico-chemical composition of the studied variants soil properties. 0-20 cm layer



20-40 cm layer



□ the original soil condition ▤ control ▨ background ▩ N120P120K120 ▩ defecate

It was identified that humus content sharply reduced in all the experiment variants in layer 0-20 cm to about 2 % during the topinambour vegetation period. This phenomenon can be explained by strengthening the processes of dehumification under row crops. This

difference is less evident in layer of 20-40 cm. Maximum loss (1,05 %) is on variant with mineral fertilizers use. Minimum loss is on the variant with manure use (0.25 %). Change of the indicators of actual and potential acidity is different on the experiment. The greatest acidification is on variant $N_{120}P_{120}K_{120}$ both in layer 0-20 cm and in layer 20-40 cm that is related with the effect of high mineral fertilizers doses. Change of the sum of exchangeable bases allow to estimate soil formation feature, the anthropogenic impact including. Special role is played not only by the sum of exchangeable bases, which depends on the quantity and quality of soil colloids, the character of its change is even more important. Short supply of the exchangeable bases is on variant with mineral fertilizers according to the original soil condition. The least deficit is on variants with manure and meliorant use. All agricultural practices of topinambour cultivation reduce the degree of soil saturation with bases compared to the original condition. The most saturated soil samples are on variant $N_{120}P_{120}K_{120}$.

Thus, it was proved that topinambour cultivation causes deterioration of physic-chemical soil composition as a result of strengthening the processes of dehumification and decalcification. It is explained by biological nature of the analyzed crop. Topinambour is an industrial crop of high removal of nutrient elements. However, the composition of the results obtained in the analysis of all the studied variants, show that the use of defecat significantly reduces metabolic and hydrolytic acidity, stabilize the content of the exchangeable bases and humus, and improve the leached chernozem stability to anthropogenic impact.

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УДК 634.21(470.32)

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DIE SORTEN UND DIE UNTERLAGEN DER APRIKOSE DER ZENTRALEN SCHWARZERDEREGION

Аннотация: В Воронежском государственном аграрном университете имени императора Петра I селекционерами кафедры плодоводства созданы новые сорта абрикоса, обладающие зимостойкостью, крупноплодностью с плодами высоких вкусовых качеств и технологических свойств. Выделены зимостойкие клоновые подвои для создания слаборослых абрикосовых садов интенсивного типа.

Ключевые слова: абрикос, сорта, клоновые подвои, интенсивные сады.

Die Aprikose ist eine weithin für die Bevölkerung der zentralen Schwarzerderegion Russlands bekannte Kultur. Sie kennzeichnet sich durch ihre zarten und aromatischen Früchte, die über den Nährwert, ihre Heileigenschaften sowie dekorative und ästhetische Vorteile verfügen. Die Anpflanzungen von Aprikosen konzentrieren sich in der Region der Mikrozonon mit günstigeren Böden und klimatischen Bedingungen. Hier fruchten die Bäume regelmäßiger.

Die Kultur hat ein intensives Wachstum mit einem frühen Einstieg in die Zeit der Fruchtbildung, hoher potentieller Produktivität und früher Reifung der Früchte. Sie verfügt über eine kurze Ruhepause, niedrige Winterfestigkeit von generativen Fruchtknospen, frühe Blütezeit der Bäume. Darum besteht eine große Gefahr von Blütenbeschädigungen der Aprikose im Frühling durch Frosthäufigkeit.

Beim rationellen Herangehen zur Wahl des Gartenstandorts, des Sortiments und der Agrartechnik, die den biologischen Besonderheiten entsprechen, können die Aprikosengärten produktiv und rentabel sein.

An der Araruniversität Woronesh wurde am Lehrstuhl für Obst- und Gemüsebau viel von den Wissenschaftlern A.N.Wenjaminow, L.A.Dolmatowa, R.G.Nosdratschjewa für die Züchtung der Aprikosensorten mit hoher Winterfestigkeit, Dürrebeständigkeit ausgezeichneten Geschmackseigenschaften und technologischen Eigenschaften sowie stabiler Ertragsfähigkeit gemacht, die für den Anbau in den Gartenanstalten zu empfehlen sind. Es wurden mehr als zwanzig Aprikosensorten gezüchtet, aber am vorzüglichsten für die Bedingungen der Schwarzerderegion sind die Sorten: Triumph sewernij, Kompotnij und Sürpris [1].

Triumph hat eine hohe Winterfestigkeit des Holzes, aber die der Blütenknospen ist nicht so hoch. Das erste Fruchttragen tritt auf das 4. Jahr des Lebens des Baumes. Die Sorte ist selbstbefruchtend und bringt jedes Jahr die vergrößerte Ernte ein. Der Baum ist kräftig und zweigtragend. Diese Sorte ist gegen die Erstickung der Rinde im unteren Teil des Stammes resistent. Die Früchte bis zu 55 Gramm haben eine rund - ovale Form. Die Haut ist behaart, mitteldick und sauer. Die Färbung in voller Reife von der Schattenseite ist gelb-orangegrünlich. Die oberste Schichtfärbung stellt eine massive verschwommene dunkelrote Farbe. Das Fruchtfleisch ist orange, saftig, zart. Der Kern ist süß.

Die Sorte Kompotnyj unterscheidet sich durch eine hohe Winterfestigkeit. Der Baum ist kräftig und hat eine kompakte Krone. Das Erwachen der Knospen und die Triebbildung ist gut. Diese Sorte gibt die Triebe der zweiten Wachstumswelle gut. Die Sorte ist selbstbefruchtend und bringt eine stabile Ernte mehr als 27 kg von einem einzigen Baum. Die Früchte halten an den Zweigen fest und bröckeln nicht. Die Sorte ist resistent gegen Klyasterosporios und Moniliosis. Der Stamm ist resistent gegen den Sonnenbrand und das Anfaulen der Rinde. Die Rinde ist dunkel mit gut sichtbaren weißen Rissen. Die Blätter sind klein. Die Früchte erreichen bis zu 40 g. Die Färbung der Früchte ist hellgelb mit heller Röte. Das Fruchtfleisch ist fest, saftig, knackig, orange und hat einen süß-sauren Geschmack. Der Kern ist bitter. Die Früchte reifen Anfang August.

Sürpris - Die Widerstandsfähigkeit des Holzes ist gut, aber die von Blütenknospen etwas niedriger. Die Sorte ist teilweise selbstbefruchtend mit dem Frühreifen. Der Baum ist mittelgroß, die Krone ist rund, zweig schwach. Die Triebbildung ist mittelgroß. Die Triebe haben eine mittlere Länge und Dicke. Die Stengelglieder liegen nah bei-

einander. Die Blätter sind mittelgroß und glatt. Die Früchte sind ziemlich groß - bis zu 45 g. Der Kern ist oval, ziemlich groß. Die Früchte ist eiförmig, schwach komprimiert. Die Haut ist samtig und behaart, leicht wellig. Der Kern ist süß. Die Haut ist hellgelb mit kaum bemerkbarer Röte. Das Fruchtfleisch ist hellgelb, zart, aber etwas trocken und hat einen mittleren Zuckergehalt mit schwach saurem Geschmack. Reifezeit Ende Juli. Die Tafelsorte ist gut für die Verarbeitung.

Parallel dazu wurde am Lehrstuhl für Obst-und Gemüsebau der Agraruniversität Woronesh die Zuchtarbeit nach der Bildung der winterständigen Klonsteinobstbäume durchgeführt. Durch die zwischenartliche abgelegte Hybridisation wurden die Unterlagen OP 23-23, OPA 15-2, AKU 2-31, OD-2-3, E 13-27 erhalten, die über eine hohe Winterfestigkeit des Wurzelsystems verfügen. Sie können der Kälte bis zu -14...16°C überstehen und haben die Wachstumskraft und die Verträglichkeit wie das Steinobst. Die Autoren dieser Unterlagen sind A.N. Wenjaminow, A.G. Turowzewa, L.A. Dolmatowa [2].

Durch die mehrjährigen Untersuchungen von Frau Professor Doktor R.G. Nozdracheva wurden die Möglichkeiten der Vermehrung von Saatgut der Aprikose mit Anwendung der Aprikosensämlinge, Kirschpflaumen und Klonunterlagen der Selektion der Agraruniversität Woronesh erforscht. Als Ergebnis dieser Arbeit ist die Anbautechnologie von Aprikosen mit Hilfe der Klonunterlagen, um die Verträglichkeit der Klonunterlagenkomponenten verschiedener Sorten zu bestimmen und die Vermehrungstechnologie zu verbessern. [4]

Bei der Züchtung der Aprikose mit der Einsetzung von Klonunterlagen wurde im Unterschied zum Kernobst ein verschiedener Einfluss auf die Wachstumsaktivität, die Frist des Eintrittes ins Fruchttragen, den Ernteertrag und die Qualität der Früchte aufgewiesen. Die Höhe- und Breitesenkung der Krone ist mit den Besonderheiten der Wechselwirkungen zwischen den Komponenten der Sortenunterlagen verbunden.

Um die Verträglichkeit der Klonunterlagen für die neuen Aprikosensorten im Garten aufzuweisen und die optimale Ernährungsfläche für einen Baum zu bestimmen, muss man noch weitere Untersuchungen durchführen.

Bei der Anpflanzung der Bäume nach dem Plan 5x3 m kann man auf einem Bodenhektar 666 Aprikosensämlinge und 833 Klonunterlagen OII-23-23 nach dem Plan 4x3 m anbauen.

Moderne intensive Gärten sollen sich durch eine dichte Anordnung der Bäume im Garten unterscheiden. Daraus folgt, dass die Verbesserung und Entwicklung von Technologien von Pflanzengut in einer Gartenanstalt werden die Produktion von Pflanzengut für den Ausbau der Flächen für die neue Kultur beschleunigen.

Bei der Auswahl des Sortiments, dem Anpflanzungsplan, der Art der Unterlage, der Höhe und Breite der Krone, kann man die Produktivität von Dauerkulturen von Aprikosen und die Qualität der Früchte über die Kontrolle bringen.

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DIE ZUCKERRÜBE IN DEUTSCHLAND

Аннотация: Особенности производства и переработки сахарной свеклы в Германии

Ключевые слова: сахарная свёкла, Германия, особенности производства.

Zucker war bis zur Mitte des 18. Jahrhunderts ein begehrtes und kostbares Süßungsmittel, das ausschließlich aus dem in Übersee an-

gebauten Zuckerrohr gewonnen wurde. Erst im Jahr 1747 entdeckte der Chemiker Andreas Sigismund Marggraf, dass heimische, als Viehfutter angebaute Rüben Zucker enthalten. Nachdem es Franz Carl Achard gegen Ende des 18. Jahrhunderts gelungen war, aus verschiedenen Futterrüben eine weißschalige Rübe mit erhöhtem Zuckergehalt, die weiße schlesische Rübe, zu selektieren, errichtete er 1801 in Schlesien die erste Rübenzuckerfabrik der Welt. Nach und nach entwickelten sich in den Folgejahren Rübenanbau und Rübenverarbeitung in ganz Europa.

Der Zuckergehalt der Rüben betrug damals ca. 4 Prozent. Die kontinuierliche Entwicklung in der Pflanzenzüchtung und den Anbaumethoden haben dazu geführt, dass die Zuckerrübe heute einen Zuckergehalt von 17 bis 22 Prozent aufweist. Sie ist die zuckerreichste Pflanze in Europa.

Die Zuckerrübe gehört zur Familie der Gänsefußgewächse. Sie ist eine zweijährige Pflanze, die im ersten Jahr ausschließlich vegetative Organe bildet (Blätter, Rübenkörper, 2 m tief reichende Faserwurzeln). Im Rübenkörper werden Kohlenhydrate in Form von Saccharose gespeichert. Nach einer winterlichen Ruhepause entwickelt die Rübe im zweiten Jahr einen bis zu einem Meter hohen, reich verzweigten Blütenstand, der die Samen ausbildet. In Deutschland werden Zuckerrüben nur einjährig zur Zuckergewinnung angebaut.

Die Zuckerrübe ist ein wichtiger Bestandteil der landwirtschaftlichen Fruchtfolge. Insbesondere getreidebetonte Fruchtfolgen werden durch den Anbau von Zuckerrüben aufgelockert.

Rübenanbau und Zuckerproduktion in Deutschland 2012/13

In der Bundesrepublik Deutschland wurden im Wirtschaftsjahr 2013/14 in 30.663 landwirtschaftlichen Betrieben Zuckerrüben angebaut. Gegenüber dem Vorjahr verringerte sich die Rübenanbaufläche im Jahr 2013 um 8.6 % auf 315.548 ha. Aus den auf dieser Fläche angebauten und geernteten Zuckerrüben (rund 21 Mio. t) wurden in 20 Zuckerfabriken Zucker erzeugt. Die Zuckererzeugung aus Rüben ist 2013/14 mit 3.428.298 t um 14.6 % bzw. Rund 586.000 t niedriger ausgefallen als im Vorjahr (4.013.887 t).

Tabelle 1.

	2010/11	2011/12	2012/13
1	2	3	4
Anbaufläche (in ha)	344 820	357 032	345 254
Anzahl der Rübenanbauer	32 542	31 886	31 319

Tabelle 1. Fortsetzung

1	2	3	4
Durchschnittliche Anbaufläche eines Rübenanbauers (in ha)	10,6	11,2	11,0
Rübenanlieferung (in t)	22 441 432	25 028 051	24 610 437
Rübenenertrag (in t/ha)	65,1	70,1	71,3
Zuckergehalt (in %)	17,3	18,0	18,2
Zuckerertrag (in t/ha)	10,0	12,0	11,6
Zuckererzeugung (in t Ww)	3 469 277	4 266 670	4 013 887

Ww = Weißzuckerwert

Standorte des Zuckerrübenanbaus und der Zuckerfabriken

Wichtige Standorte des Zuckerrübenanbaus und der Zuckererzeugung in der Bundesrepublik Deutschland sind das südliche Niedersachsen (Braunschweiger und Hildesheimer Börde), das Rheinland zwischen Bonn und Krefeld (Köln-Aachener Bucht), Gebiete am Main, an der Donau, am nördlichen Oberrhein und in Württemberg sowie in Sachsen-Anhalt die Magdeburger Börde, in Sachsen die Leipziger Tieflandbucht, in Thüringen das Erfurter Becken sowie Gebiete in Mecklenburg-Vorpommern.

Zuckermarkt

Im Wirtschaftsjahr 2012/13 wurden in Deutschland 2.242 Mio. t Zucker abgesetzt. Davon gingen rund 87 Prozent an die Zucker verarbeitende Industrie und das Handwerk sowie an die chemische Industrie bzw. Fermentationsindustrie. 13 Prozent wurden als Haushaltszucker in Form von Raffinade, Puder-, Würfelzucker, Kandis und anderen Sorten vorwiegend über Discountmärkte und den Lebensmittelhandel verkauft. Die gesamte pro Kopf zur Verfügung stehende Zuckermenge (einschließlich des Zuckers für die Non-Food-Verwendung) ist in Deutschland seit über 40 Jahren mehr oder weniger konstant. So bewegte sich der Pro-Kopf-Absatz von Zucker in den Jahren von 1970/71 bis 2012/13 zwischen 33 und 37 kg und lag im Durchschnitt bei 35 kg pro Kopf und Jahr. Unter Berücksichtigung des Zuckerabsatzes für Nichtnahrungszwecke liegt der Verbrauch für die menschliche Ernährung deutlich darunter.

Tabelle 2. Zuckerbilanz (- in t Ww -)

Anfangsbestand	1 191 768	1 222 350	2 070 849
Erzeugung	3 469 277	4 266 670	4 013 887
Einfuhr	612 822	640 664	615 668
Ausfuhr	831 736	1 049 561	948 695
Inlandsabsatz	3 219 781	3 009 274	2 923 251
Endbestand	1 222 350	2 070 849	2 242 869

Quelle: BLE, Stat. Bundesamt

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SELECTION OF APRICOT ON COMMODITY QUALITIES OF FRUITS

Аннотация: В Воронежском государственном аграрном университете на кафедре плодоводства и овощеводства созданы сорта абрикоса для промышленных садов ЦЧР. Проводится изучение абрикоса, из которых выделены формы, отличающиеся стабильным плодоношением с разным сроком созревания плодов и химического состава.

Ключевые слова: Абрикос, сорта и формы, биологические особенности, химический состав плодов.

One of the main objectives is to create a selection of varieties differing in stable yields, with fruits of high commodity qualities. Important part belongs to the production of stone fruits, one of which is apricot. It is characterized by the rapid growth of shoots and the formation of the crown, early entry into fruiting, high yield. The fruits have high taste qualities, dessert and technological qualities. According to biological features apricot can produce fruit annually as it forms generative buds from the previous year vegetative mass branches. Unfortunately due to the extreme temperatures in winter after prolonged thaw being the reason of generative buds winter frosts hardness, spring frosts return during flowering and fruit set, weak resistance to fungal and bacterial diseases irregular fruiting was observed thus limiting the areas of industrial plants production.

The future of apricot in Central Cernozem region depends on the availability of high-yield intense varieties developed by the research institutions. Selection of apricot on the creation of winter-hardy varieties is conducted at the department of fruit and vegetable production of Voronezh state agricultural university. The study of apricot collection made it possible to produce the following varieties: Triumph

north, Surprise, Compote, Champion of the North suitable for cultivation in the industrial gardens of the specialized farms of Voronezh region. Varieties differ by the strength of growth, entry into fruiting, fruit ripening term. Apricot varieties collection requires updating, new varieties addition fortified by food, biologically active and other useful substances. Identification of apricot forms with high taste and technological qualities is an urgent research aspect.

The purpose of the research is to evaluate the forms of apricot of Voronezh State Agricultural University selection on fruit commodity qualities. The research problems are to study the term of blossoming and maturing of fruits, to determine the average mass of their fruits and their chemical composition. As the objects of the research the following forms of apricot were used: 1-6 (Nephrite), 2-42 (Orange summer), 6-39 (First-born), 6-45 (Gold domes) 8-62 (Beacon), 9-54 (Speckled) the grades received from the seeds Triumph Northern from free pollination. As a control variant the grade Triumph Northern, imparted on apricot seedlings is accepted. The apricot trees were planted in 2006 in the botanical garden of Voronezh SAU. The research was conducted in 2013-2014 according to "The program and a technique of fruit strain investigation of fruit berry and nut bearing crops» (1999).

One of the major criteria to evaluate economic grade value are commodity and consumer qualities of fruits. They develop a set of various properties such as sizes, forms, colorings, taste, consistence of pulp, chemical composition.

Forms 1-6, 9-27 are characterized by early maturity, fast yield increase. They steadily form winter-hardy buds for the next year yield. They are profusely blossoming, but they are damaged by a monolial burn during the rainy period of blossoming.

In the spring 2013 apricot blossoming was from 3 to 5 points depending on a form. The term of fruit maturing was defined in comparison with the control grade Triumph Northern (the average term of maturing). The early term of fructification (July, 12) is noted at an apricot form 1-6, form 2-42 belongs to midterm ripening grade, apricot 6-39, 6-45, 8-62, 9-54 belongs to late term forms (August, 10). Due to introduction of early ripening and late ripening grades it is possible to prolong term for about a month of fresh fruits consumption. The aver-

age mass of fruits at the studied forms of an apricot varies from 25.3 at form 2-42 to 40.9 at the grade Triumph Northern. On this basis it is possible to draw a conclusion that the above mentioned forms of an apricot concede on fruit fineness to the grade Triumph Northern (control).

Apricot fruits are various in coloring, forms, taste.

Fruit taste is a difficult sign defined by a combination of sugars, acids, aromatic substances, pulp juiciness and its consistence. In 2013 at the laboratory of biological analyses of VSAU and Federal State Institution of the Center of agrochemical service "Voronezhsky" chemical analysis of apricot fruits in absolutely solid substance was carried out. It is established that in apricot fruits of the substances studied forms distinctions in indicators of the substance content are noted. So apricot contains : moisture - 85,2-88,8%, ashes 4,65-7,25%, solids - 11,2-14,7%, sugars - 4,5-22,0%, organic acids - 3,5-9,4%, vitamin C - 0,42-1,66 mg/kg, carotene 50-96 mg/kg, potassium 1,35-2,11%, calcium - 0,15-25%, phosphorus 0,17-0,31%, nitrates – 1101-1896 mg/kg. The greatest number of solids and sugars is contained in fruits form 2-42, acids and carotene of potassium and calcium - in form 6-45, phosphorus and nitrates form 6-39, the smallest in form 2-42.

The conducted research proved that the studied apricot forms received from Triumph Northern seeds by free pollination show distinctions according to the maintenance of its chemical composition in fruits which depends on the action of many genes, their quantitative and qualitative state and combination at natural crossing of parental forms.

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**PROBLEM OF CHERNOSEM CONSERVATION,
RATIONAL USE AND FERTILITY IMPROVEMENT IN
CENTRAL CHERNOZEM AREA.**

Аннотация: В статье идет речь о проблемах сохранения плодородия чернозема; формулируются важные причины и современные подходы рационального использования и повышения плодородия почвы в ЦЧР; отражается новизна результатов и область их применения.

Ключевые слова: чернозем, гумус, органическое вещество, минеральные удобрения, воспроизводство плодородия, детрит.

Humus has always been the most fertile soil, characterized by favorable water-air, thermal and nutrient regimes for the production. But unfortunately they were used without fertilizer application, as it was believed that a good harvest could be produced without manure [1].

V.D. Pannikov, P.G. Aderikhin, P.G. Akulov showed that as a result of ploughing and irrational use of virgin soils humus content in them significantly decreased and in 50-60th some even highly humoserine soils contained less humus. This is confirmed by the data obtained at the Agricultural Research Institute after V.V.Dokuchaev. Humus content defined in 1883 by V.V. Dokuchaev, and in 1960-1980th by other researchers indicates that soils with humus content of 10-13% in the Central Chernozem area have disappeared. In most parts of the region its content decreased 1.5 times - from 7-10 % to 4-7 %. Soils area with humus content of 2-4 or even 0.5 to 2.0 % has significantly increased [2].

30-50% of the total humus losses out of the last hundred years took place during the last 25 years, when slopes and light sandy soil were plowed [3].

Data received by the Institute in the Central Chernozem area "Giprozem" prove a significant decrease of humus in the soils of Central Chernozem area. Over the last 20 years leached chernozem lost annually to 0.6 t/ha of humus. Currently, the average annual losses of humus are 0.7-0.9 t/ha [4].

For scientific forecast of humus dynamics it is necessary along with the regularities of changes of soil organic matter to know the quantity and quality of the organic matter introduced, the nature of its localization in the topsoil, as well as the factors affecting the rate of its transformation [5].

I.V. Tyurin believed that organic matter content in soils depends on the original material and the conditions of decomposition. This idea is confirmed by M.M. Kononova, E.A. Afanasiev, L.N. Alexandrova, V.V. Ponomareva, T.A. Plotnikova, M.V. Fedorov, M.I. Sidorov, N.I. Zezyukov.

Dehumified residues are readily available energy material for soil microorganisms and determine the species and quantitative composition of microflora. Fresh soil organic matter is an energy material for free-living nitrogen-fixing microorganisms. Biologically active substances such as antibiotics, vitamins, enzymes, amino acids are introduced to the soil from plant residues [6].

Weight of plant residues and their chemical composition depends on the type of plant, fertilizers. The same crops, but grown with the use of different fertilizers systems vary considerably according to the quantity of crop root residues [7].

Winter crops and perennial grasses leave most dehumification residues cultivated in the Central Chernozem area [8].

Weather conditions noticeably influence by the amount of root mass. Stronger root system is developed in dry years to form dry matter unit than in make favourable years. The increased precipitation does not stimulate the root system development. Large role in regulating the number of residues belongs to fertilizers. Their positive impact on the accumulation of dehumification organic matter was noted by many researchers [10]. The rate of mineralization and, therefore, the content of humus reduce lion can significantly slow down or speed up depending on the crop rotation. The introduction of the fallow and row crops accelerates decomposition of organic matter, perennial grasses sowings and their long term usage does not only suspend usage but also partly compensate the loss of humus. It is experimentally shown

[11] that according to the loss of organic matter the fields of crop rotations (t/ha) can be put as follows: 1.2-1.6, 0,7-1,5, winter wheat - 0.4 to 0.7, spring grains 0.5 to 0.6 [9].

However information about the weight and quality of plant residues on a number of field crops is lacked or very poor, as for the most commonly cultivated in the Central Chernozem area crops this information (due to soil and climatic conditions varying, levels of agronomy techniques, sampling terms, seeding rate, etc.) is very controversial. In general the quantity and quality of organic matter left in the soil of the Central Chernozem area by different cultures required study and clarification. We studied these questions.

It is known that only dehumification of plant residues is not enough to recover the reserves of humus in arable chernozem. It is necessary to apply both mineral and organic fertilizers. The scientists opinion on the efficiency of mineral fertilizers is contradictory. Some believe that due to the growth in the number of admissions in the soil root and crop residues corresponding to a greater harvest mineral fertilizer are able to maintain a constant level of humus. Others on the basis of the disproportional growth of crops and number of root residues argue that is impossible to maintain the humus content at a constant level using only mineral fertilizers [12].

Application of large doses of nitrogen fertilizers over a long period can lead to the increased soil acidity leading to calcium leaching from the topsoil. Currently due to the economic crisis, liming is reduced everywhere, the area of acid soils being increased. In case of the process continuation, all arable soils will soon become acid in the Central Chernozem area [13].

Many believe that only mineral fertilizers (without manure) cannot maintain humus content at a consistently high level [14].

The influence of manure on humus accumulation in chernozem compared with the initial state depends both the soil and climatic conditions, the dose of its application. Small doses of manure [15] do not prevent loss of humus, but significantly reduce them compared to non-fertilized variant.

The views of researchers on the effect of organic mineral fertilizers on the accumulation of humus in chernozem are very controversial. Some believe that their usage does not completely prevent its loss [16], while the others support it is at the baseline [17]. The rest are of the opinion that such fertilizers contribute to the humus accumulation

[18]. In recent years in conditions of mineral and organic fertilizers deficiency a sharp intensification of the processes of soil fertility degradation, the search for additional sources of fertility reproduction is very important.

Straw is an important source of organic matter. The national average cereals straw yield is about 300 million tonnes: about 80 is used as fodder, 20 as mat, 30 for the needs of hydrolysis industry, and the remaining 170 should be used to fertilize fields and in greenhouses. Unfortunately the straw excess and even stubble is burnt [19].

It is revealed that biological crop straw plowing adds organic matter to the soil [20], increases biological activity, has a beneficial effect on the development of the root nodule bacteria of legumes and their assimilation of atmospheric nitrogen increasing the number of free-living nitrogen-fixing microorganisms reducing the loss of nitrogen fertilizers, positively effecting soil water-physical properties and making it more resistant to water and wind erosion [21].

However most studies were conducted in short-term at single application of one type of straw under separate crops. There is little data on the effect of long-term introduction of straw and its combinations with other fertilizers on the dynamics of humus. This important question for the production conditions demanded the study and refinement which was done by us.

Green manure can be good source of replenishment of soil organic matter. In Russia manure crops are fairly well studied.

Green manure biomass contains as much nitrogen as bedding manure, but a bit less phosphorus and potassium. So clover green mass contains 0.7-0.8% nitrogen, 0.05% phosphorus 0.19 0.20 % potassium and 0.9 to 1.0% calcium. Utilization of nitrogen by plants from the in the first year, is more than from manure and is 22-27 % [15].

Data on the effect of siderale on phosphate and potash modes is very controversial. According to some studies green manure reduces or increases the content of phosphorus and potassium available to plants [16].

When green manure is tilled acidity soil decreases buffering capacity of the soil and increases.

Joint application of green and mineral fertilizers is more efficiently than their separate application [22].

The researchers' opinion on the influence of green manure on the balance of humus is contradictory. Some believe that these agromonic practice increases, the other think it decreases the humus content [14]. Contradictory opinions on the role of green manures in the soil fertility requires further study and clarification in relation to the Central Chernozem area. This gap was filled.

Intensive use of chernozem with large doses of mineral fertilizers has led to the widespread acidification of soils [19]. Agrochemical examination of soils in regions with a predominance of chernozem revealed 13-15 million hectares of acidic soils (pH 4 KCL 5.5 and below). The average annual decrease in the pH of the soil environment is 0.03. It is difficult to limit the process of acidification of chernozem because the level of organic fertilizers application is insufficient. Lime fertilizers are not applied properly [21].

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GETREIDE IN DEUTSCHLAND

Аннотация: продовольственная проблема – одна из наиболее острых проблем, стоящих перед человечеством. Германия – страна, которая с помощью использования современных технологий в сельском хозяйстве получает одни из самых высоких урожаев зерновых культур в мире.

Ключевые слова: Озимая пшеница, урожайность, валовый сбор, Германия

Das Korn ist eine Hauptquelle der Lebensmittelproduktion für den Menschen und des Futters für die landwirtschaftlichen Tiere, es dient auch als Rohstoff für die Industrie und für die Produktion der Bioenergie. Die Getreidekulturen in der Welt nehmen daneben 35 % der Ackerböden ein. Trotz der zahlreichen Arten, der Formen und der Sorten der Sommer- und Wintergetreidekulturen ist ihre Züchtung bei verschiedenen Boden- und Klimabedingungen möglich. Der Anteil des Getreides leistet einen großen Einfluss auf die Wirtschaftsbedingungen [1].

Das Klima in Deutschland ist gemäßigt und bildet einen Übergang zwischen dem westeuropäischen Maritim-Klima und dem osteuropäischen Kontinentalklima. Der Einfluss des Golfstroms sorgt für die vergleichsweise hohe Durchschnittstemperatur. Je nach Region schwankt diese zwischen 12,7 Grad im Süden und 14,3 Grad im Westen. Der durchschnittliche Höchstwert liegt im Juli bei 23,6 Grad im Osten, im kühleren Norden liegt das höchste mittlere Temperaturmaximum bei 22,3 Grad im August. Der Januar ist durchschnittlich der kälteste Monat. Im Westen ist es auf fünf Grad wärmer. Den Gegenpol bildet der kältere Süden mit durchschnittlich 1,4 Grad. Niederschlag fällt vor allem im Süden und Westen durchschnittlich 126 oder 132 Regentagen im Jahr. Die Regentage sind allerdings unterschiedlich verteilt. Im Süden regnet es vor allem während der Sommermonate, im Westen hingegen tritt während des Winters vermehrt Niederschlag auf. Im Norden sind die Regentage sehr gleichmäßig über das Jahr verteilt und im Osten gibt es sowohl während des Übergangs zwischen Frühling und Sommer als auch im Winter in etwa gleich viele Regentage. Der Süden ist die sonnenreichste Region Deutschlands, hier gibt es im Jahresdurchschnitt 4,6 Sonnenstunden pro Tag. Im Norden und Westen sind es durchschnittlich nur 4,1 Stunden täglichen Sonnenscheins. Im Norden ist der Juni der sonnigste Monat in anderen Teilen Deutschlands wird der jeweilige Höchstwert im Juli erreicht. An den Küsten im Norden liegt die Wassertemperatur von Nord- und Ostsee in der Jahresmitte bei neun Grad. Der Höchstwert liegt jeweils bei durchschnittlich 17 Grad im August [2].

Tabelle 1. Pflanzliche Erzeugung in Deutschland- Feldfrüchte

Fruchtart	Anbaufläche		Hektarertrag		Erntemenge	
	2013	2014	2013	2014	2013	2014
	1.000 Hektar		Dezitonnen(dt)		1.000 Tonnen	
1	2	3	4	5	6	7
Weizen	3.128	3.234	80	86,2	25.019	27.870
Winterweizen	3.066	3.173	80,3	86,7	24.634	27.500
Sommerweizen	53	50	62,2	60,1	332	299
Hartweizen	9	11	61,3	64,6	53	72
Roggen/Wintermenggetreide	785	636	59,8	61,4	4.689	3.907
Triticale	397	425	65,9	73,6	10.344	11.664
Gerste	1.570	1.584	65,9	73,6	10.344	11.664
Wintergerste	1.211	1.235	69,3	77,5	8.398	9.573

Tabelle 1. Fortsetzung

1	2	3	4	5	6	7
Sommergerste	359	349	54,2	59,9	1.946	2.092
Hafer	131	125	47,7	50,7	628	636
Sommermenggetreide	17	15	46,7	47,8	81	70
Kornermais und CCM	497	480	89,1	98,7	4.387	4.742
Getreide insgesamt	6.526	6.499	73,2	79,9	47.757	51.922

Die landwirtschaftlich genutzte Fläche in Deutschland von 16,7 Millionen Hektar besteht zu 71 Prozent aus Ackerland und zu 29 Prozent aus Grünland. Auf den 11,9 Millionen Hektar Ackerland wurden 2014 6,5 Millionen Hektar Getreide angebaut. Gegenüber dem Vorjahr waren dies fast 65.000 Hektar weniger. Raps wurde auf rund 1,39 Millionen Hektar angebaut, was gegenüber 2013 ein Minus von 68.000 Hektar ausmacht. Der Anbau von Silomais stieg 2014 um 89.000 Hektar auf knapp 2,1 Millionen Hektar.

Trotz insgesamt schwieriger Erntebedingungen erreicht die deutsche Getreideernte in 2014 mit 51,9 Millionen Tonnen (einschließlich Körnermais) ein Niveau, das um fast 9 Prozent über dem guten Vorjahresergebnis liegt. Ausschlaggebend für den Zuwachs sind bei nahezu unveränderten Anbauflächen deutlich höhere Erträge. Regional gesehen ist die Ertragsentwicklung wegen unterschiedlicher Witterungsbedingungen allerdings uneinheitlich.

Im Wirtschaftsjahr 2013/14 legten die Getreideexporte Deutschlands auf knapp 15 Millionen Tonnen kräftig zu. Nach dem bereits deutlichen Anstieg im Vorjahr wuchs das Exportvolumen von Weizen auf das Rekordhoch von über 10,5 Millionen Tonnen. Davon gingen 40 Prozent in die EU-28, 40 Prozent nach Asien und knapp 20 Prozent nach Afrika. Hauptabnehmer von deutschem Weizen war auch 2013/14 der Iran vor Saudi Arabien.

Angesichts hoher Ernten, insbesondere bei Mais, ist der globale Getreidepreisindex der FAO in 2014 gefallen. Im Oktober jedoch erholten sich die Preise auf den internationalen Getreidemärkten wieder leicht, besonders bei Weizen. Im dritten Quartal 2014 lag der Preisindex um 13 Prozent unter dem entsprechenden Vorjahresstand. Im Oktober 2014 lag das Preisminus gegenüber Vorjahr bei 9 Prozent. Gebildet wird der FAO-Getreidepreisindex auf Basis der Exportpreise für Weizen, Mais und Reis an den wichtigsten globalen Handelsplätzen.

Trotz der in 2014/15 komfortablen Versorgung rechnen FAO und OECD mittelfristig mit einer weiter eher knappen globalen Versorgungssituation und somit mit einem sich wieder festigenden Pre-

isniveau. Als Gründe werden das weitere Bevölkerungswachstum, begrenzte Anbauflächen und verringerte Produktivitätsfortschritte angegeben. Marktexperten erwarten weiter große Preisausschläge (Volatilitäten) [3].

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FEUERBRAND IN DER LITERATURÜBERSICHT DER DEUTSCHSPRACHIGEN AUTOREN

*Аннотация: Бактериальный ожог плодовых культур - опасное инфекционное заболевание культурных и дикорастущих растений семейства розоцветных, вызываемое карантинным объектом - бактерией *Erwinia amylovora*. Эффективной защитой от ожога плодовых культур является биологический бактерицид, что является альтернативой антибиотикам.*

Ключевые слова: косточковые, цветок, яблони, защита, бактерии.

Feuerbrand, verursacht durch das Bakterium *Erwinia amylovora*, zählt zu den gefährlichsten Krankheiten bei Kernobst (Apfel, Birne und Quitte). Seinen Namen verdankt der Feuerbrand dem Aussehen befallener Bäume. Sie sehen wie verbrannt aus.

Der Erreger überwintert in Fruchtmumien und in sogenannten Cankern in befallenen Bäumen. Canker sind krebsartige, brandartig eingefallene Rindenstellen, die meist rotbraun bis schwarz gefärbt sind. Die aus dem Vorjahr stammenden Canker werden im Frühjahr

aktiv und beginnen an den Randzonen Bakterien Schleim (Exudat) zu bilden. Der zuckerhaltige Schleim lockt Insekten an, die die Bakterien weiterverbreiten. Auch durch Wind und Regen kommt es zu einer Verbreitung der Feuerbrandbakterien.

Die weitaus meisten Neuinfektionen durch Feuerbrand finden während der Blüte statt. Bei entsprechenden Witterungsbedingungen stellt jede geöffnete Blüte eine potenzielle Eintrittspforte für den Erreger dar.

Zur gefürchteten Blüteninfektion bei Kernobst kann es kommen, wenn während der Blühperiode ideale Vermehrungsbedingungen (Temperatur $> 18^{\circ}\text{C}$, hohe Luftfeuchtigkeit) für das Bakterium herrschen. Das Bakterium wird von Bienen und anderen blütenbesuchenden Insekten zusammen mit Pollen auf die Narben der Kernobstblüten transportiert, wo es sich vermehrt. Nach einer Vermehrungsphase auf der Narbe, wird ein Nässeereignis (Niederschlag oder Tau) benötigt, um die Bakterien zu den Nektarien im Blütenboden zu transportieren, über die sie in die Pflanze eindringen. 10 bis 20 Tage danach werden die Symptome an den Blüten, Blütenbüscheln und Rosettenblättern sichtbar.

Sanitäre Maßnahmen in der Obstanlage und in der Umgebung der Obstanlage zielen darauf ab, die Menge an Feuerbrandbakterien, die als Inokulum für neue Infektionen zur Verfügung steht, möglichst gering zu halten.

Maßnahmen:

Regelmäßige Befallskontrollen in der Anlage und in der Umgebung;

Ausreißen von Symptomen bis weit ins gesunde Holz;

Gegebenenfalls Rodung befallener Bäume;

Ausschneiden von Cankern beim Winterschnitt;

Entfernen von Fruchtmumien in Anlagen mit Vorjahresbefall;

Vorblütebehandlungen mit Kupfer sollen die Cankeraktivität reduzieren. Es gibt allerdings keine Belege für deren Wirksamkeit.

Auch mit regelmäßigen Kontrollen und konsequenten sanitären Maßnahmen kann nicht garantiert werden, dass der Erreger in einem bestimmten Gebiet komplett eliminiert wird. In vielen Bäumen findet sich latenter (symptomloser) Befall und auch eine symptomlose, epiphytische Vermehrung des Erregers in Blüten von Nicht-

Wirtspflanzen ist möglich. Der Feuerbranderreger kann sich also symptomlos und damit nicht sichtbar über längere Zeit in einem Gebiet aufhalten, so dass man immer mit dem Vorhandensein von Inokulum rechnen muss.

In Befallsgebieten muss trotz durchgeführter phytosanitärer Maßnahmen mit dem Eintrag des Erregers in die Blüte gerechnet werden. Da die Vermehrung von *E. amylovora* auf den Blütennarben und die anschließende Infektion der Blüte vor allem von der Temperatur abhängt, wurden verschiedene Prognosemodelle (z.B. Maryblyt, Cougarblight, Billings Integrated System) entwickelt. Diese prognostizieren während der Blütezeit die witterungsbedingte Infektionsgefahr für die Pflanze und ermöglichen gezielte Behandlungen. In Deutschland, Österreich und der Schweiz wird meist das Modell Maryblyt verwendet.

Für eine Infektion müssen laut Maryblyt folgende Voraussetzungen erfüllt sein (1):

Blüten müssen geöffnet sein.

Die Stundengradsumme zur Basis 18,3°C (CDH18; EIP-Wert) muss innerhalb der Lebensdauer einer Blüte 110 erreichen. Die Lebensdauer der Birnenblüte bzw. Apfelblüte beträgt dabei 66,7 bzw. 44,4 Tagesgrade über 4,4°C.

Regen Oder starker Tau.

Am Tag der Infektion muss eine Durchschnittstemperatur von 15,6°C erreicht werden.

Tage an denen alle 4 Bedingungen erfüllt sind werden als potenzielle Infektionstage (I) angezeigt. Wenn drei der vier Bedingungen erfüllt sind wird ein hohes Infektionsrisiko (H) angezeigt. Auch H-Tage können zu Infektionen führen (1).

Gewünscht ist der gezielte Einsatz von wirksamen Präparaten nach Feuerbrandprognose. In den USA, dem Land mit der längsten Feuerbrandgeschichte, wurde dafür hauptsächlich das Antibiotikum Streptomycinsulfat eingesetzt. Langjährige Erfahrungen zeigen, dass mit streptomycinhaltigen Präparaten hohe Wirkungsgrade erzielt werden können. Die Behandlung wird gezielt an mit den Prognosemodellen errechneten Tagen mit hohem Infektionsrisiko ausgebracht. Allerdings traten in den USA und auch in Israel nach intensivem Streptomycineinsatz auch bald streptomycinresistente Stämme des Feuer-

branderregers auf, so dass in diesen Ländern intensiv nach Alternativen gesucht werden muss. So werden in den USA neben den Antibiotika Oxytetracyclin und Kasugamycin auch diverse bakterielle Antagonisten (*Pseudomonas fluorescens*, *Pantoea agglomerans* und *Bacillus subtilis*) geprüft.

In der EU sind Antibiotika in der Landwirtschaft zunehmend unerwünscht. So hat auch Streptomycin keine Zulassung als Pflanzenschutzmittel in der EU und kann deshalb in den meisten EU-Ländern nicht eingesetzt werden. Ausnahmeregelungen gibt es in Deutschland seit 1994. In Deutschland werden streptomycinhaltige Präparate immer wieder über eine so genannte „Gefahr im Verzug Zulassung“ kurzfristig für die Dauer der Obstbaumblüte genehmigt. Diesen Genehmigungen hat sich in den letzten Jahren Österreich und die Schweiz angeschlossen, so dass auch dort Streptomycin eingesetzt werden konnte. Allerdings gibt es keine Garantie, dass dies auch in den Folgejahren wieder möglich sein wird. Zudem weigert sich der Lebensmitteleinzelhandel in Österreich, Obst aus streptomycinbehandelten Anlagen in den Verkehr zu bringen.

2009 wurde die Anzahl der genehmigten Streptomycinanwendungen erstmals auf 2 reduziert, da in den Vorjahren Streptomycinrückstände in Früchten gefunden wurden. Zusätzlich wurden häufig Streptomycinrückstände in Honig gefunden, der dann von den Erwerbsobstbauverbänden der Länder aufgekauft und vernichtet werden muss. Aus diesem Grund wird auch in Europa intensiv nach alternativen Bekämpfungsmöglichkeiten gesucht.

Im ökologischen Anbau in Deutschland werden die Pflanzestärkungsmittel Blossom Protect und das saure Gesteinsmehlpräparat Myco-Sin verwendet. Auch diese Präparate werden anhand der Feuerbrandprognose terminiert. Allerdings wird der Einsatz am Tag vor möglichen Infektionsbedingungen empfohlen. In einigen Ländern (z.B. Italien, Schweiz) ist Serenade (Wirkstoff: *Bacillus subtilis*) zur Feuerbrandbekämpfung zugelassen.

Diese Präparate wurden 2010 auch in der integrierten Produktion zur Ergänzung der nur noch zwei möglichen Streptomycinanwendungen empfohlen und stehen als Alternativen bereit, falls keine weiteren Ausnahmegenehmigungen für Streptomycin mehr erteilt werden.

Triebinfektionen treten nach der Blüte meist in Anlagen auf, in

denen auch Blüteninfektionen stattgefunden haben und dadurch ein hohes Infektionspotential vorhanden ist. Zur Infektion des Blattes und darauffolgend des Triebes, müssen Wunden als Eintrittspforten für den Erreger vorhanden sein. Ein erhöhtes Infektionsrisiko ergibt sich auch bei Befall mit Läusen und nach Hagel.

Indirekt wird also Triebinfektionen durch Feuerbrand mit einer konsequenten Blattlauskontrolle entgegengewirkt. Der Einsatz von Streptomycin (wenn zugelassen) oder Kupfer (Indikation Apfelschorf) kurz nach einem Hagelereignis sind umstritten, da nur Behandlungen sehr kurz nach dem Hagel erfolgversprechend sind und keine genauen Daten über diesen Zeitraum vorliegen.

Das einzige in Deutschland zur Bekämpfung von Feuerbrandtriebinfektionen zugelassenes Mittel ist Regalis (Prohexadion-Ca). Dieses wirkt als Wachstumsregulator und muss vorbeugend ca. 5-10 Tage vor der möglichen Inokulation ausgebracht werden.

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**INFLUENCE OF PRESEEDING PROCESSING OF SEEDS
AND NONROOT TOP DRESSING OF PLANTS ON
PRODUCTIVITY OF WINTER SOLID WHEAT IN THE
CONDITIONS OF FOREST-STEPPE OF CENTRAL
CHERNOZEM REGION**

Аннотация: В условиях лесостепи ЦЧР на двух сортах озимой твердой пшеницы (Золотко и Дончанка) изучали влияние предпосевной обработки семян препаратами Плодородие Сибири, Авибиф, Альбит, Рексолин АВС и Витазим на перезимовку растений и эффективность их отдельного и комплексного действия на урожайность при некорневой подкормке.

Ключевые слова: озимая твердая пшеница, сорт, предпосевная обработка семян, полевая всхожесть, перезимовка, некорневая подкормка, урожайность.

Introduction. Many years the staff of the department of plant breeding of VSAU studied the possibility of the varieties introduction of winter durum wheat in Central Chernozem Region. Its selection in Russia is conducted successfully [1, 7, 10]. In recent years crop practice widely applies various preparations to processing of seeds and plants. These preparations increase resistance of plants to stresses, productivity increase and production qualities of various field cultures [5] improvement. Selection of the effective preparations providing the increase in productivity of winter durum wheat varieties in new areas is important. Preseeding processing of seeds with modern preparations improves sowing qualities of seeds and rewintering of plants, stimulates their growth and increases productivity. Along with disinfecting of seeds dresser it is important to choose properly growth regulators for preseeding processing of seeds. Some preparations (retardant, in-

hibitors) have negative effect on viability and linear growth of sprouts [3, 9, 11]. Others strengthen metabolic processes, increase resistance of plants to stresses, productivity and quality of production [2, 4, 8]. Many growth regulators promote fuller use of potential of a grade. High-quality reaction to regulators and microfertilizers [5] is known.

Processing of plants by growth regulations will affect formation of a grain yield and its quality [5, 9, 11].

Preseeding processing of seeds, along with none root top dressing is economically very effective way of microfertilizers use, growth regulators of and other preparations [6].

The purpose of the research is to reveal efficiency of preseeding processing of seeds and none root (sheet) top dressing by preparations Plodorodie Sibiri, Avibif, Albite, Reksolin ABC, Vitazim on rewintering and productivity of two varieties of winter durum wheat Zolotko and Donchanka..

Research technique. Experiments were conducted on the fields of Voronezh SAU in 2012/13–2013/14. According to the three-factorial scheme: factor A – variety; factor B – preseeding processing of seeds; factor C – none root top dressing.

The soil of the site was chernozem lixivious medium loam. The maintenance of humus in an arable layer of 4.5%, pH – 6.1-6.9, the bases saturation degree– 74-76%, content of exchange potassium – 11.7-14.4 mg and mobile phosphorus – 7.3-11.8 mg per 100 g of the soil.

The registration area of an allotment in 2013 was 48 sq.m, and in 2014 – 18 sq.m.

In field conditions defined density of plants standing in crops of of winter durum wheat studied varieties, defined the extent of their rewintering and productivity.

Field viability of seeds was defined as percentage of a number of shoots to total number of seeds per 1 sq.m.

Extent of rewintering of plants was determined as a percentage of a number of the wintered plants (on the fixed 6 or 8 platforms by 0.25.m²) to a number of the plants tranfered to winter.

Winter durum wheat (varieties Zolotko and Donchanka) was sowed on black steam in an ordinary way on the depth of 5-6 cm at seeding norm of 6 million pieces/hectare at the end of the optimum

terms (September, 5 and 12). The seeds were disinfected by Vintsit Forte, by one of the following preparations: Plodorodie Sibiri, Avibif, Albite, Reksolin ABC and Vitazim.

As a general rule the following types of the mechanized operations were carried out: early-spring top dressing by ammonium nitrate; at the tube phase – sheet top dressing by urea solution; as pesticidal processing required (herbicide Calibre + the Humate Kalia Cufler); insecticide Detsis Profi; fungicide Titus Duo.

Processing of plants by the studied preparations was carried out manually with rucksack sprayer at the emergence of a flag leaf or at the beginning of a earing.

Cleaning was carried out at full ripeness of grain by SAMPO small-sized combine. The recalculated bunker grain yield was 100% purity and 14% humidity.

Results and discussion. Field viability of winter durum wheat seeds (varieties Zolotko and Donchanka) in average was almost identical (79.2% and 78.8 %) for the studied period. Processing of seeds by the studied preparations improved field viability and rewintering of both varieties (tab. 1).

Table 1. Density of standing and extent of rewintering of plants of varieties of winter durum wheat depending on processing of seeds rostreguliruyushchy preparations, 2012/13–2013/14.

Varieties of winter durum wheat	Preparation for processing of seeds	Number of plants during the prewinter period, piece/sq.m	Field viability, %	Number of the wintered plants, piece/sq.m	Extent of rewintering, %
1	2	3	4	5	6
Zolotko	Control	469.5	78.2	408.0	86.9
	Avibif	471.5	78.6	417.5	88.6
	Plodorodie Sibiri	472.0	78.7	421.0	89.2
	Albite	481.5	80.2	428.0	88.9
	Reksolin ABC	477.0	79.5	425.0	89.1
	Vitazim	474.5	79.1	419.0	88.3
	Average	474.3	79.2	419.8	88.5

Table 1. Continuation

1	2	3	4	5	6
Donchanka	Control	465.0	77.5	364.5	78.3
	Avibif	469.0	78.2	374.5	79.8
	Plodorodie Sibiri	474.0	79.0	381.5	80.5
	Albite	478.0	79.7	383.5	80.2
	Reksolin ABC	472.5	78.8	379.5	80.3
	Vitazim	471.0	78.5	376.0	79.8
	Average	471.6	78.8	376.6	79.8

It was shown in the form of a tendency. In average field viability of the processed seeds of varieties Zolotko and Donchanka was 79.2% and 78.8% respectively. In comparison to the control ones it increased by 1.0 and 1.3%.

Processing of seeds by preparation Albite provided the best field viability of winter hard wheat seeds of both varieties (Zolotko – 80.2%, Donchanka – 79.7%). It is higher by 2.0% and 1.5%. Other studied preparations also increased field viability by 0.4-1.3% in comparison with the control one. But they conceded to the best option.

Plants of Zolotko variety had the best winter hardiness. The quantity of the wintered plants was 8.5-8.8% more than at the variety of Donchanka.

Preseeding processing of seeds by growth regulators impacted plants rewintering. Were the plants which seeds were processed by the preparation Plodorodie Sibiri. In this option the tendency of plants rewintering improvement up to of 89.2% in crops of Zolotko variety and 80.5% – in Donchanka variety was noted. It is 2.3% and 2.2% higher than the control one.

Productivity of winter durum wheat strongly varied depending on a variety, preseeding processing of seeds and none root (sheet) top dressing (tab. 2).

Table 2. Productivity of varieties of winter durum wheat depending on preseeding processing of seeds and sheet top dressing (an average for 2013-2014).

Note: 1. Control 1a and 1b – seeds of varieties Zolotko and Donchanka didn't process growth regulations.

2. 2 – plants of both varieties didn't process control growth regulations y preparations.

Varieties of winter durum wheat (factor A)	Preparation for processing of seeds (factor B)	Preparations for sheet top dressing of plants (factor C)						
		Контроль 2	Avibif	Plodorodie Sibiri	Albite	Reksolin ABC	Vitazim	Average
Zolotko	Control 1a	23.7	26.4	27.8	31.5	29.9	33.1	28.7
	Avibif	26.5	29.3	28.5	28.6	31.0	33.0	29.5
	Plodorodie Sibiri	29.2	33.8	39.1	34.9	36.6	36.2	35.0
	Albite	32.0	36.5	36.1	36.7	35.6	34.3	35.2
	Reksolin ABC	27.8	33.8	32.1	30.2	33.0	32.4	31.5
	Vitazim	29.4	35.1	34.2	34.4	33.2	33.5	33.3
	Average	28.1	32.5	33.0	32.7	33.2	33.7	32.2
Donchanka	Control 1b	23.6	29.2	28.2	28.4	32.2	30.5	28.7
	Avibif	20.7	28.9	28.8	30.4	32.0	31.3	28.7
	Plodorodie Sibiri	26.9	32.8	35.0	33.4	37.2	35.9	33.5
	Albite	26.3	34.8	35.9	35.1	35.5	34.0	33.6
	Reksolin ABC	22.9	29.3	34.1	35.7	34.3	31.5	31.3
	Vitazim	25.3	31.6	28.7	31.4	34.6	32.8	30.7
	Average	24.3	31.1	31.8	32.4	34.3	32.7	31.1

Higher productivity of winter durum wheat (as well as the best winter survival) is recorded at variety of Zolotko. It was 32.2 c/hectare. It is 1.1 c/hectare higher in comparison with a variety of Donchanka.

For processing of seeds the preparations Albite, Plodorodie Sibiri and Vitazim appeared to be the best. They increased productivity. Preseeding processing of Donchanka seeds by preparations Avibif and Reksolin ABC without sheet top dressing (control 2) was not effective. Productivity was lower than the option without processing (control 1b) up to 2.8 and 0.6 c/hectare or 12.1 and 2.5% respectively.

These preparations processed vegetative plants. The best result by productivity was noted at sheet top dressing of plants by preparations Albite (31.5 c/hectare on a variety of Donchanka) and Reksolin ABC (32.2 c/hectare on a variety of Donchanka) without seeds pre-

seeding processing (control 1a and 1b). Sheet top dressing on all the options provided productivity increase.

Zolotko variety was very sympathetic on preseeding processing of seeds by all the studied preparations, especially Albite (the increase to control 1a made 8.3 c/hectare or 34.4%), and also by Vitazim (5.7 c/hectare or 23.5%) and Plodorodie Sibiri (5.5 or 22.7%). Processing of seeds by Reksolin ABC and Avibif increased Zolotko productivity but to a lesser extent (4.1 c/hectare or 16.8% and 2.8 c/hectare or 11.3%). It is by obvious by connected with high-quality features. Improvement of food of sprouts of Zolotko variety is possible. It was more effective, than the density of a productive stalk.

Donchanka variety is much weaker and reacts to preseeding processing of seeds differently. Plodorodie Sibiri, Albite and Vitazim increased productivity of Donchanka in comparison with the control one by 1b to 3.3; 2.7 and 1.7 c/hectare or to 14.0; 11.4 and 7.2%. Processing of seeds by preparations Avibif and Reksolin ABC was inefficient. It lead to the decrease in productivity (on 2.9 and 0.7 c/hectare) in comparison with the control one (the antagonism phenomenon).

The studied preparations of winter durum wheat varieties reacted to sheet top dressing in different ways. Donchanka as on option without pre-souring processing of seeds and especially, at options with processing by the studied preparations was often more sympathetic to it. For example, at option without pre-souring processing of seeds (control 1b) the productivity increase from sheet top dressing Reksolin ABC was 8.6 c/hectare (36.4%), and when processed by Reksolin ABC the increase from sheet top dressing by Albite was 12.8 c/hectare (35,6%).

The results received in two-year field experiments allow the following pre-trial conclusions:

1. crops varieties of winter durum wheat Zolotko and Donchanka successfully wintered.

2. the best rewintering (88.5%) and high productivity (32.2 c/hectare) were shown by Zolotko variety.

3. the best rewinterings is marked out when processing seeds of both the varieties by preparation Plodorodie Sibiri.

4. the increase in productivity from preseeding processing of seeds (on 5.5-8.3 c/hectare – Zolotko variety and by 1,7-3,3 c/hectare

– Donchanka) was shown using preparations Albite, Plodorodie Sibiri and Vitazim.

5. the increase in productivity from sheet top dressing by the studied preparations was shown in all the options.

6. preseeding processing of seeds variety Donchanka by preparations Avibif and Reksolin ABC was inefficient.

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APPROACHES TO DETOXIFICATION OF FUEL IN AGROCENOSES

Аннотация: в статье рассматривается проблема влияния мазута на прилегающие агроценозы.

Ключевые слова: экология, экологические проблемы, агроценозы, мазут.

The annual world production of crude oil is more than 2.5 billion tons, and the demand for oil continues to grow and increases annually

by about 8%. Oil production grows respectively at an average rate of 5% per year. During extraction, transportation, processing, use of oil and oil products the losses are about 50 million tons per year.

The observed in the world oil pollutions are the main, and sometimes the dominant of complex nature anthropogenic factors, adversely affect all the biosphere components. About half of them falls into the soil and underground water, the other half contaminates the surface runoff and waters. According to the degree of negative impact on the ecosystems oil, oil products and oil-containing industrial wastes occupy the second place after radioactive contamination. In Russia, about 800 thousand hectares of contaminated land are in need of recultivation [1].

The main sources of landscapes pollution by oil and oil products are the mining companies, system pumping and transportation, oil terminals, rail, river and sea oil-loading items tankers, gas and petroleum station. The volume of oil waste and oil spills, accumulated at individual facilities, accounts a large amount of cubic meters. A significant number of oil sludge and waste stores were built in the early 50 s. Being aimed as a means of oil spills prevention they have become a source of contaminations.

Protection and proper use of natural resources, monitoring the condition of air and water environment, rational use and protection of land, soil, rivers, forests, wildlife is world wide problem, great attention being given to the activities aimed at the solution of the problem.

Main agricultural lands pollutants are oil and fuel oil, which significantly differ in the ratio of light and heavy fractions.

Oil from light brown liquid (almost colorless) to almost black one (although there are items of even emerald green color).

Aromatic hydrocarbons are the most toxic oil components. They are chronic toxicants. In particular, very active and high-speed toxicants include low-boiling arena - benzene, xylene, toluene. Many other aromatic hydrocarbons are characterized by evident mutagenicity and carcinogenicity. The most dangerous is a group of polyaromatic hydrocarbons. [3].

The aim was to determine the possibility of using agroecosystems for oil detoxification.

The objectives of the research were:

- to evaluate the state of soil biotic complex when applied to the fuel oil system;
- to establish the possibility of using Vico-Sudanese mixture for phytoremediation;
- to determine the economic efficiency of the agro-ecosystem for oil detoxification;

The obtained results allow predicting the rate of self-purification of oil-contaminated leached humus, to determine the extent of environmental damage from pollution and to use the most efficient adsorbents for agro-ecosystems recovery.

Methods.

The direct objects were soil-biotic complex, oil, Sudan grass [4].

We determined the phytoremediation feasibility of humus polluted with oil products. The scheme of the experiment includes the following options:

1. Control
2. Soil contaminated with fuel oil
3. Sand contaminated with oil

At the early stage of the experiment all requirements for the field experiment were taken into consideration (principle of the only difference, type, accuracy, reliability).

To study the phytoremediation of soils contaminated with fuel oil we used the field experiment.

The compared option is the one without any oil application. Soil pollution was conducted by sand, contaminated with 10% fuel oil, at the rate of 5 t/ha. The size of the plots of 5 square meters. The experiment was conducted 4 times. Experimental options were systematic.

RESULTS

In general techniques of agroecology bookmarks and conducting experiments are used in the experiment.

Soil is the most important abiotic component of the natural environment. Due to its special properties, it plays a crucial role in economic activity as the major means of production. The state of the soil largely determines the ecological balance in the system.

Currently more than 55 thousand different chemical compounds are identified in the environment, they are the product of human activities. Many of them are dangerous to living organisms.

The greatest danger in environmental pollution are industrial enterprises waste, oil and oil products, heavy metals, pesticides, dioxins, nitrosamines, polycyclic aromatic hydrocarbons, polychlorinated biphenyls (PCBs) and polychlorinated biphenyls[2].

Contaminants in the environment react with its components, migrate through trophic chains. They accumulate and metabolize forming new chains, often more harmful than the original substance.

It was established that upon fuel oil, thus and crude oil contact with soil enveloping soil particles with hydrophobic film, which leads to sharp decrease in the soil ability to retain moisture and, as a result deform the natural patterns of soil moisture movement.

Soil moisture in the option soil+oil and sand+oil has not changed significantly and ranged from 10.6 to 13.8 per cent.

Integral indicators of soil pollution are: phytotoxicity (soil properties to inhibit the growth and development of higher plants) and genotoxicity.

In May, at the option soil+oil soil toxicity increased to 63.8%. At the option of sand+oil it was less than 30.9%.

In June, at the option soil+oil soil toxicity was 59.9 %, and at the option sand+oil it was less than 24%.

In September, at the option soil+oil soil toxicity amounted to 64.4% and at the option sand+oil it was less than 19.8%.

Detoxification and mineralization of oil hydrocarbons take place with the active redox enzymes participation, including catalase and dehydrogenase. Their activity level is the criterion of soil self-purification from oil hydrocarbons [2].

A number of scientists prove that in, the content of mobile phosphorus and potassium reduces the soil polluted by fuel oil nitric mode. Such changes are caused by the disturbance of the soil water-air regime as a result of filling pore space with petroleum products.

A significant portion of the nitrogen is lost from the soil due to denitrification. For detoxification of land contaminated with pollutants, including oil products phytoremediation is widely used.

By phytoremediation (from Greek "fiton" - plant and Latin "Remedio", restore) we mean the technology for the environmental cleanup using plants and their associated organisms.

The idea of the biological soil and ground waters treatment is obvious. The plant stores the soil pollutant in its shoots. They are heavy metals, toxic organic compounds, radioactive pollutants. The advantage of phytorestation compared to the other methods is that the toxins are removed from the soil without destroying its structure and decreasing of soil fertility [5].

In the experiments carried out in the early years of the study spring wheat, barley, sorghum, maize, hairy vetch sowing on oily soils did not succeed, that is even the crop germination was not obtained. In the spring of 2013 only hairy vetch (winter) formed a small biomass, but the field germination rate did not exceed 25-30%.

Monitoring the development Vico-Sudanese mixture makes it possible to consider that Sudan grass is more resistant to pollution. In contrast to the hairy vetch it forms biomass faster.

At the first mowing compared to the control one at the option soil+oil the yield decreased by 56.1%, at the option of the sand+oil it decreased by 61.6%.

At the second mowing compared to the control one at the option soil+oil the decreased by 48.3%, and at the option sand +oil by 62.9 %.

CONCLUSIONS

1.The studies allow to conclude that soil moisture contamination from fuel oil compositions soil+oil and sand + oil significantly decreased at the option soil+oil.

2.Toxicity great decreases in contamination of leached chernozem of the option soil+oil 63%.

3.Soil biological activity at the option soil+oil in from 47 to 68 %, and at the option sand+oil-44-63 % decreased.

4.Due to complex productivity of Vico-Sudanese mixture decreased at the 1st mowing at the option sand+oil 61 %, and at the option soil+oil by 56 %. At second mowing option soil+oil decreased by 48%, and at the option sand+oil in decreased by 62 %.

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FODDER PREPARED FROM AMARANTH (AMARANTHUS L.)

Аннотация: Показана целесообразность использования кормов, приготовленных из амаранта. Приведены результаты полевых и лабораторных исследований амаранта, как кормовой культуры.

Ключевые слова: амарант, зеленый корм, силос, сено, лист, жмых, проростки, урожай, качество кормов.

Amaranth is a good fodder crop. Presently in Voronezh, OC “Russkaya Oliva” seeds of amaranth fodder breeds Kinelsky – 254, Gigant, Voronezhsky and others are produced, while Voronezh State

Agricultural University is working out crop breed cultivating agro-technologies.

Fodder amaranth is a high-stem (up to 2 metres and more) perennial plant.

Green fodder. In herbage, amaranth leaves make up 35-40%, inflorescences – about 18-30%, stems – 30-35%.

Amaranth green fodder crop yield makes up about 40, 0 ton/ha and more (table 1).

Table 1. Amaranth green fodder output yield at distinct vegetative stages, ton/ha. Amaranth variety Gigant (VSAU, 2011-2012).

Amaranth Vegetative Stages	Herbage			Dry Basis		
	2011	2012	Average	2011	2012	Average
Initial Blossom	36,0	46,0	41,0	4,14	5,06	4,6
Initial Seed Formation	45,1	67,0	56,0	5,70	9,8	7,74
Milky Seeds	41,2	59,0	49,1	4,94	9,75	7,35
Aftergrowth	7,5	9,0	8,25	0,9	1,26	1,08
Plant Seed Formation 05	3,3	3,9	-	0,93	0,85	-

Almost 70.0 ton/ha were harvested in 2011 in Pavlovsky district (farm “Rassvet”), Voronezh region.

Amaranth herbage is well consumed by all kinds of livestock (cow, pig and sheep) and fowls (chicken, duck, goose, turkey).

Amaranth green fodder crop productivity to a greater extent depends on the development stage, i.e. on usage terms. Maximum crop of green fodder and dry basis was harvested at the initial seed formation. Further on at seed formation stage the lower leaves fall off, which reduces green fodder and dry basis crops yield.

Nutritiousness of green fodder also depended on amaranth harvest phase (table 2).

Table 2. Nutrient content and vitamins in Amaranth herbage, yielded for fodder at various phenophases (Voronezh SAU, 2010-2011).*) NES – nitrogen-free extractive substances

Nutrients	Amaranth Development Stages			
	Shooting	Budding	Blossoming	Seeds Milky-Wax Ripeness
<i>Nutrients, Measured In % to Dry Basis</i>				
1	2	3	4	5
Crude Protein	27,06	25,92	25,92	18,9
Digestible Crude Protein	17,1	14,3	13,6	13,0

Table 1. Continuation

1	2	3	4	5
NES*)	45,0	45,3	48,6	51,2
Fiber	18,8	20,8	22,4	23,0
Sugar	6,24	6,45	7,20	6,7
Starch	25,3	24,5	26,3	25,2
Fat	2,56	2,8	4,9	5,2
Organic Acids	8,02	8,12	9,27	9,5
Ash including calcium	12,8	19,2	12,6	13,1
	2,15	2,18	2,24	2,26
<i>Vitamins, mg/100g</i>				
Carotene	192	200	235	180
Vitamin E	12,56	13,12	14,78	14,8
Vitamin C	43,56	47,12	50,29	47,0

Amaranth green fodder in dry basis contains (%): digestible protein 15,6 – 16,7 (twice more than in corn), fat 2,6 – 5,2, cellulose 18,8 – 23,0, calcium 2,1 – 2,3, phosphorus 0,2 – 0,21, and carotene 180 – 200 mg/kg [2].

Amaranth is a source of full value protein. 1 kg of amaranth dry vegetative basis contains lysine 7,1 – 7,15 (of corn dry basis – 2,8 g, i.e. 2,4 times less). Upon that, fiber content amounts to 16 – 20%, soluble sugars content – 6,4 – 7,2%, and pectin content – 9,5 – 11,3%.

Amaranth also contains carotene, ovoflavin, folic acid, vitamins C and B2. Substances contained in amaranth enhance palatability and digestibility, strengthen immunity.

Herbage humidity reached maximum when early harvested at shooting stage (86%) and at budding stage (84%) as contrasted to later stages (at blossoming stage – 80%, in the period of seeds milky-wax ripeness – 76.5%). As for green fodder dry basis content, it increased correspondingly from early usage dates (13.8 – 15.4%) to later ones (20 – 23.5%), but its protein content by the course of it decreased, while content of nitrogen-free extractive substances raised.

Amaranth herbage contains on average 200g protein per fodder unit. Feeding the product in pure form results in protein overexpenditure. Therefore, it has to be used in mixture with corn herbage, both at feeding fodder and at ensilaging. This is to provide for balanced fodder gain and increase cow milk productivity [1,2,3,4,5,6,7].

Silage. Amaranth contains few soluble sugars, therefore does not have good silage properties. Nevertheless, it can be used for ensilag-

ing, provided that optimal terms and methods of silage making are applied. We studied the effect of amaranth cropping at different development phases on silage quality.

Chopped crop was ensilaged in $0.5m^3$ plastic bags. It was first pressed, then put into the bag, after which air was pumped out and vacuum created in. Amaranth cropping and ensilaging was performed: at initial blossom stage (humidity 84.7%), at seeds milky (80%) and milky-wax ripeness (79%) stages. After three months storage silage quality was assessed (table 3).

Table 3. Silage quality of the Amaranth yielded at various vegetative stages. (Voronezh SAU, 2010-2011).

Plant Development Stage at Silage Making	Grass Moisture, %	Dry Basis Losses, %	Silage Moisture, %	pH	Content %			
					NH ₃	Organic Acids		
						Lactic Acid	Acetous Acid	Butyric Acid
Initial Blossom Stage	82-85	11,3-2,6	83,5-85,5	4,4-5	0,06	2,26	0,69	0,02
Seeds Milky Ripeness	79-81	6,0-13,6	80,1-82,3	4,5-4,7	0,05	3,64	0,40	0,00
Seeds Milky-Wax Ripeness	76-78	1,5-2,8	79,1-80,7	4,3-4,7	0,04	3,02	0,36	0,00

Amaranth plants show best technological ensilaging properties at seeds milky-wax ripeness stage, when their humidity makes up 76 – 78% (as contrasted to 82 – 85% at initial blossom stage). It reduces significantly juice leakage nutrient losses and lowers fermentation intensity, thus minimizing expenditure of nutritious substances. Oil acid does not appear. Use of conservants in amaranth ensilaging, when at that ripeness stage, is not advisable, as fodder conservation improves naturally in consequence of increase in content of oxalic acid and other organic acids.

When ensilaging in rainy weather, such conservants as formic acid or its mixture with propionic and acetous acids are to be used.

Dried leaves. Amaranth leaves are a perfect fodder for all kinds of livestock and fowl. Dried leaves (or hay leaf) are a substitute for high-costly grass meal. Leaves are separated from less feed-valuable stems. Digestibility of leaves is 40% higher than that of stems. Carotene in leaves is preserved better and longer than in grass meal. Well-leaved and high-protein amaranth plants are a valuable raw product

for hay leaf conservation in summer period (from July 15 to 31 – the first mowing, and from August 15 to 31 – the second mowing). Potential amaranth herbage yields on the first and second mowing are about 350 and 150 dt/ha. Dry basis output amounts to 15 – 20%. Percentage depends on weather conditions in cropping period, as well as on cropping timelines. Hay leaf output from dry basis is higher when cropped at early growth and development stages. At stage of shooting (tillering) it amounts to 36 – 39%, at blossoming stage – 23 – 29%, while in ripeness period it goes down to 18 – 20%. Besides, early-season variety Voronezhsky gives higher output (254) than Gigant and Kinelsky. Hay leaf is also rich in nutrients (table 4).

Table 4. Hay leaf nutrient content in various Amaranth varieties, % (VSAU, 2011-2012)

Nutrient	Amaranth Variety		
	Valentina	Karakula	Shuntuk
Moisture	6,75	6,87	6,56
Crude Protein	23,20	22,60	20,03
Crude Fat	4,73	4,81	4,63
Ash	13,00	13,14	13,02
Fiber	22,01	22,97	21,03
Starch	17,80	17,65	22,67
Organic Acids	9,52	9,12	9,30
Alkaloids	3,02	2,63	2,76
Fodder Units (in 100 kg)	16,97	16,45	15,56

Important: We carried out the analysis of the hay leaves at the shooting stage of the plant, in July.

Depending on variety and development phase, amaranth hay leaf might contain: crude protein 20 – 23%, crude fiber 21 – 23%, organic acids 9.3 – 9.5%, carotene 193 – 235 mg/100g, and a large number of vitamins B1, B2, B6, E, PP, C. As far as nutrients content is concerned, amaranth dry leaves are highly competitive with leaves of alfalfa.

As for alkaloids (basically, amaranthine), they make up 0,8% in small plants, and more (up to 3,18%) – in ripening ones.

Proteins present in amaranth hay leaf (18.15 – 23.17%) possess complete number of essential amino acids. For example, in 2012 amino acid composition was as follows (mg/100g protein): valine 41,6 – 42,3; isoleucine 35,8 – 37,2; lysine 62,3 – 64,5; methionine + cystine

42.1 – 42.5; threonine 35.0 – 36,0; arginine 21,1 – 23,0; tryptophane 15.0 – 15.4; phenylalanine + tyrosine 69.8 – 70,1.

Different amaranth varieties hay leaf has rich vitamin and mineral composition (table 5), which is highly competitive with alfalfa and, moreover, exceeds the latter in content of vitamins E, PP, C and B2, as well as in ash elements content.

Thus, a range of amaranth varieties (Gigant, Valentina, Karakula, Shuntuck etc.) are valuable for feeding. They are high-stem (especially Gigant and Shuntuck) and well-leaved, form substantial herbage yield that contains a lot of protein, vitamins and mineral elements, and is suitable for use as green fodder, silage, and hay leaf for feeding livestock and fowl.

Table 5. Hay leaf vitamins and mineral elements content in various Amaranth varieties, mg/100g (VSAU, 2012).

Values	Amaranth Variety		
	Gigant	Valentina	Sam
Vitamins			
Carotene	192,5	200,3	235,2
Thiamine (B1)	0,318	0,324	0,112
Riboflavin (B2)	0,312	0,315	0,196
Vitamin B6	0,192	0,197	0,018
Vitamin E	12,56	13,12	14,78
Niacin PP	6,62	6,98	8,52
Vitamin C	43,56	47,12	50,29
Mineral Elements			
Sodium (Na)	20,31	21,01	21,90
Kalium (K)	611,2	617,3	635,2
Calcium (Ca)	215,6	218,2	224,0
Magnum (Mg)	155,3	162,0	167,0
Ferrum (Fe)	3,32	3,58	4,05
Phosphorus (P)	97,5	101,2	112,1

Amaranth grain is a good feed for pigs and poultry. It contains (%) protein 16 – 20, oil 6 – 8, fiber 5, ash 3, starch 64 – 70. In nutrient density (caloric content) and number of mineral elements it exceeds some of other crops (table 6).

Table 6. Amaranth grain nutritive value compared with the wheat and the bean, (% in dry basis). (VSAU, 2001)

Values	Amaranth Variety Voronezhsky	Wheat	Bean
1	2	3	4
Protein	17,52	13,0	21,48
Fat	7,48	1,70	1,96

Table 6 Continuation

1	2	3	4
Kalium	0,61	0,40	1,30
Magnum	0,25	0,10	0,19
Calcium	0,28	0,02	0,14
Sodium	0,03	0,01	0,02
Calories in 100g grain	440	354	361

Amaranth grain protein is complete. However, in amino acids content, grain and fodder amaranth varieties diverge significantly (table 7).

Table 7. Grain amino acid content in various Amaranth varieties, g/100g Protein (VSAU, 2011-2012).

Values	Fodder Varieties		Grain Variety
	Kizlyarez	Universal	Voronezhsky
Arginine	1,73	2,16	1,86
Lysine	0,79	0,86	0,86
Tyrosine	0,56	0,58	0,65
Phenylalanine	0,63	0,63	0,68
Histidine	0,30	0,35	0,36
Leucine	0,81	0,86	0,86
Isoleucine	0,51	0,52	0,54
Methionine	0,37	0,38	0,47
Valine	0,61	0,62	0,66
Proline	0,64	0,67	0,69
Threonine	0,64	0,34	0,67
Serine	0,95	1,05	1,09
Alanine	0,59	0,62	0,61
Glycine	1,09	1,14	1,15
Cystine	0,20	0,21	0,21
Glutaminic Acid	2,44	2,94	2,62
Asparagic Acid	1,02	1,25	1,19

Grain amaranth variety Voronezhsky contains more lysine, methionine and cystine. Amaranth grain also contains a lot of vitamin E – from 7.1 (Voronezhsky variety) to 10.6 mg/100g (Universal variety).

For amaranth oil production grain is specially prepared. After extracting amaranth oil from grain by cold pressing low-protein content flour is left, as well as oil-cake containing significantly more protein than whole grain.

An efficient method of modifying grain biochemical values is processing it in extruders, where the product is exposed to action of high pressure and temperature. Consequently, fodder's taste and digestibility improve, which is followed by its detoxication.

By the course of the procedure described, starch and proteins are partly split, fiber is milled, and therefore fodder assimilation is increased. At extruding, high temperatures are applied for 10 – 12 seconds. This is the time limit just for not letting vitamins break up.

Sprouted grain. Amaranth sprouts can become a promising protein-vitamin fodder. They contain many bio-active substances, mineral elements, ferments and amino acids (table 8, 9).

Table 8. Protein amino acid content in the Amaranth and creeping trefoil sprouts, g/100g Protein (VSAU, 2012).

№	Amino Acid	Amaranth Voronezhsky	Creeping Trefoil
1	Arginine	0,12	0,09
2	Valine	0,14	0,12
3	Histidine	0,05	0,05
4	Isoleucine	0,12	0,15
5	Leucine	0,02	0,02
6	Lysine	0,17	0,13
7	Methionine + Cystine	0,08	0,04
8	Threonine	0,17	0,12
9	Tryptophane	0,04	0,05
10	Phenylalanine + Tyrosine	0,27	0,21
11	Asparagic Acid	0,23	0,25
12	Glutaminic Acid	0,29	0,24

Amaranth sprouts have higher lysine and methionine + cystine content than creeping trefoil does.

Table 9. Amaranth sprouts vitamins and ferments content.

Vitamins and Ferment	Unit of Measure	Amaranth Voronezhsky	Creeping Trefoil
Carotene, mg %	mg %	291,7	186
Thiamine (B1), mg %	mg %	0,256	0,178
Riboflavin (B2), mg %	mg %	0,316	0,215
Vitamin B6, mg %	mg %	0,207	0,112
Vitamin B9, mg %	mg %	87,15	74,08
Niacin (PP), mg %	mg %	5,190	5,087
Vitamin C, mg %	mg %	145,08	127,98
Amylolytic Activity	unit/g	115,7	43,2

In comparison with creeping trefoil (*Trifolium repens*), amaranth sprouts contain more vitamins, especially vitamins of B and C groups. Amylase activity in amaranth sprouts is 2.6 times higher than in those of trefoil.

Vitamins content is significantly higher in sprouts than in undergerminated seeds; especially dramatic is the increase in amount of vitamin C.

Thus, implementation of amaranth as new (or forgotten) fodder crop ought to solve a great number of problems in feeding livestock and fowl.

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GROWTH, DEVELOPMENT, PRODUCTIVITY AND QUALITY OF WINTER DURUM AND SOFT WHEAT IN THE CONDITIONS OF VORONEZH REGION

Аннотация: В последние годы площади посева озимой твердой пшеницы в южных регионах РФ постепенно расширяются и внедрение её в Воронежской области весьма заманчиво, так как оно отличается лучшим качеством в сравнении с зерном мягкой пшеницы. В полевых и лабораторных опытах изучали особенности прохождения этапов органогенеза двух видов пшеницы. Выявлены различия в развитии растений между озимой твердой и мягкой пшеницей в условиях лесостепи Центрального Черноземья.

Ключевые слова: озимая твердая пшеница, озимая мягкая пшеница, органогенез, зимостойкость, урожайность, масса 1000 зерен, клейковина, ИДК.

Introduction. Winter durum wheat acreage in Russia is gradually expanding due to its better quality as compared to soft winter wheat and almost twice higher productivity as compared to spring durum varieties. Our aim was to study the biological peculiarities of the crop development, quality of grain and to adapt its cultivation technology to local conditions of the Chernozem zone.

Materials and methods. Two winter wheat varieties were studied: durum Donchanka and soft Bezenchukskaya 380. Field trials took place in the Voronezh region in central Russia in 2005-2010. Vegetative cones were microscopied and photographed in MBS-10; they were taken out of 25 plants from nonadjacent replications at different plant development stages [2, 4]. Total DM yield was evaluated by analysis of variance (ANOVA) using Microsoft Office Excel 2003.

Results and discussion. Biological method of controlling plant development processes are the most efficient ones. For wheat species

it means observing the vegetative cones growth and development [1, 3]. Organogenesis stages of durum and soft wheat are not always simultaneous. The first stage of organogenesis features development of an apical meristem of the main tiller's vegetative cone, and gemma formation. No differences between the winter wheat varieties were observed in this phase. Usually 11.8 days passed between seeding and germination, drought conditions extended this period up to 14 days.

The second stage includes stem joints, leaves and internodes fecundation. The experiment took place in autumn and exposed no substantial differences between the two varieties. However in the unusually long warm autumn period of 2006, soft winter wheat cone stabilized in the second phase. It allowed forming an additional stem joint and more leaves afterwards. Durum wheat was prone to cone elongation and segmentation, 20-30 % of the plants went on to the third stage faster. As the degree of the vegetation cone development strongly correlates with plant winter survival (Table 1), most of the hardy varieties stay in the second stage of organogenesis till spring. Therefore late sowing dates are preferable for winter wheat, so that it has no time to develop to the third stage before the frosts.

Table 1. Winter survival of durum and soft winter wheat. The data is an average for 2006-2010.

Winter wheat type	Years of researches					
	2006	2007	2008	2009	2010	Average
Durum (Donchanka)	66,4	93,9	87,7	96,2	68,7	82,6
Soft (Bezenchukskaya 380)	83,2	95,1	91,1	98,1	81,3	89,8

Spring regrowth is accompanied by rapid transition to the third and the fourth stages of organogenesis, and this is when the potential spike productivity is formed. For the five years of research on average, the vegetation cone of durum wheat was larger and more differentiated. It had more spikelet calluses throughout its length. The calluses' differentiation was the most active in the 3rd and 4th segments. Then the process spread up and down the axis. This led to a faster growth of durum wheat in its 4th and 5th development phases in comparison to the soft wheat variety. Later the durum variety also surpassed the soft one in its development and passed the interphase periods faster.

Soft winter wheat was more productive for the five years on average (Table 2), being evidently better adapted to the local conditions. Its grain yield was 0.63 t ha⁻¹ higher than that of the durum variety.

Table 2. Productivity of winter durum and soft wheat in 2006-2010.

Winter wheat type	Productivity					
	2006	2007	2008	2009	2010	Average
Durum (Donchanka)	14,6	39,6	69,1	43,7	23,4	38,1
Soft (Bezenchukskaya 380)	25,9	42,6	71,8	52,3	29,4	44,4
Sign. *** $P < 0.05$	1,12	0,95	3,64	4,03	3,60	-

However the latter gave fuller grain (42.2 g /1000 pcs) with 1.0 % better protein content. Its gluten quality tests were also 1.9 % better (Table 3).

Table 3. Quality of winter durum and soft wheat in 2006-2010.

Winter wheat type	1000 grains weight, g	Gluten, %	IDK	Protein, %
Durum (Donchanka)	42,22	30,9	91,9	15,9
Soft (Bezenchukskaya 380)	41,18	29,0	81,6	14,9

And protein in grain of solid wheat was 1% better in comparison with soft wheat. According to E. P. Popova, in mealy grain of soft wheat, especially in its central part, protein doesn't form a continuous monolith with starch grains. Thus many air cavities in cages while in grain of solid wheat the proteinaceous matrix occupies all intervals between starched grains are formed and cover them with a continuous layer [5].

Conclusion. The differences between durum and soft winter wheat in the conditions of the Central Chernozem zone become detectable since the third stage of organogenesis. Durum variety features more rapid growth and development processes as compared to the soft one. This has to be considered when choosing the sowing date. Later durum wheat continues surpassing soft wheat in development and completes the interphase periods faster; however its vegetation period is 4 days longer which results in later harvesting. Its productivity is 0.63 tons or 14.2 % lower, but grain quality is better. Therefore it can

be cultivated in the forest-steppe zone with respective amendments to the technology existing for soft wheat.

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PARTICULARITÉS DE DÉVELOPPEMENT DU BLÉ D'HIVER EN AUTOMNE

Аннотация: в работе показано влияние фракций семян и сроков посева на особенности осеннего развития озимой пшеницы.

Ключевые слова: семена, фракция, сроки посева, озимая пшеница.

Le progrès génétique, en rendant les plantes plus fertiles et plus résistantes, a permis d'augmenter les rendements: en France, celui du blé a plus que triplé en quarante ans. On estime que cet essor est dû pour moitié au progrès génétique et pour moitié à l'évolution des pratiques culturales (traitements, préparation des sols...).

Le respect de l'environnement fait partie du métier des semenciers: ils élaborent des variétés plus résistantes aux maladies pour limiter l'utilisation de produits phytosanitaires, des variétés plus économes en engrais et des plantes capables d'améliorer la qualité des sols.

La qualité des semences - l'un des principaux facteurs qui déterminent le rendement à l'hectare des cultures. La science agricole rend les exigences à la qualité des semences, lesquelles sont établies par l'Etat (GOST - ГОСТ).

Les semences de qualité sont un facteur au coût le plus bas dans la production de produits agricoles, parce que l'introduction rapide de nouvelles variétés prévoit une augmentation du rendement de 20 à 30% [1].

Les propriétés des graines sont causées par des caractéristiques héréditaires de la variété (l'hybride) et des conditions de la production agricole. Par conséquent, toutes les mesures agrotechniques devraient viser à maintenir et à améliorer la viabilité des semences lors de la naissance, la croissance, le développement et le stockage, c'est à dire qu'il y aura une technologie spéciale de la cultivation des semences. C'est la qualité des semences qui peut assurer une garantie de rendement et une possibilité économique des variétés. Et inversement, les variétés à haut rendement peuvent donner un faible niveau de productivité/ha à l'utilisation de mauvaises graines lors de la semence. C'est pourquoi ce sujet des études est pertinent [2].

Le but des études est l'évaluation de l'impact des différentes méthodes d'étalonnage et la séparation des graines aux signes morphologiques des cultures du blé d'hiver.

Pour atteindre cet objectif les tâches suivantes ont été établies:

- déterminer l'effet de la taille des graines à semer à la qualité des semences.

- établir la dépendance du pouvoir germinatif des graines et des signes morphologiques des mesures du calibrage des semences et du période de semis.

Les études ont été menées à l'automne 2013 dans les champs de Centre expérimentale scientifique et technique "Agrotechnologie". L'expérience a deux facteurs: 1 - la date de semis; 2 - fractions des graines, différentes en taille et en densité. La semence a été réalisée en trois étapes - 13, 26 septembre et 4 octobre.

Après l'étalonnage, la fraction initiale de semences a été divisée:

-à l'aide du séparateur à rouleau en 5 fractions;

-à l'aide du tamis en 3 fractions;

-à l'aide du séparateur aérodynamique (SAD - САД) en 2 fractions.

La plupart des grosses graines ont été identifiées par les tamis à maille de 2.0× 3.0 mm et par le séparateur à rouleau (fractions 4 et 5). Les plus grosses graines se variaient le moins. Les fractions de semences obtenues à l'aide du séparateur aérodynamique, divisées par la densité, étaient caractérisées par la plus grande variabilité.

Tableau 1. Taille des graines de différentes fraction

Variante	Masse 1 graine			
	moyenne, g	minimum	maximum	coefficient de variation
Contrôle	54,7	26,0	70,0	13,9
Rouleau 1	42,9	20,0	54,0	14,4
Rouleau 2	49,4	38,0	60,0	8,8
Rouleau 3	54,5	40,0	66,0	9,9
Rouleau 4	60,1	46,0	70,0	7,7
Rouleau 5	60,6	51,0	70,0	7,6
Tamis 2,2	33,8	23,0	48,0	14,0
Tamis 2,5	52,7	40,0	68,0	10,8
Tamis 3	61,0	42,0	72,0	7,3
SAD 2	52,7	33,0	72,0	15,1
SAD 3	45,5	26,0	68,0	18,5

Les graines obtenues sur les rouleaux (fraction 2), et à travers le tamis à ouverture de maille de 2.2 x 3.0 mm avaient l'énergie de germination la plus élevée (95%). La plus haute germination (97%) a été observée des graines obtenues sur des rouleaux (fraction 2 et 3).

Tableau 2. Qualités des semences de différentes fractions

Variante	Énergie de germination, %	Germination laboratoire, %
Contrôle	91,5	96,5
Rouleau 1	78,0	96,7
Rouleau 2	95,3	97,3
Rouleau 3	71,3	97,3
Rouleau 4	84,0	95,3
Rouleau 5	64,0	96,0
Tamis 2,2	95,0	95,5

Continuation du tableau 2.

Tamis 2,5	86,5	95,5
Tamis 3	83,5	92,7
SAD 2	91,0	94,5
SAD 3	90,0	96,0

Le nombre des pousses et des feuilles, la quantité de tiges et la feuillaison a été fortement influencé par tous les facteurs étudiés, mais surtout par la date de semis. La masse des racines et des parties aériennes dépend de la période de semis et la date de semis, de l'action reciproque de tous les facteurs étudiés, mais surtout de la date de semis.

Tous les facteurs influençaient à la profondeur du noeud de tallage et à la longueur du point de végétation.

Le point de végétation maximale des cultures a été dérivée des semences de 2 et 3 fractions du séparateur SAD. Le point de végétation minimale - a été dérivée des semences des grosses graines, obtenues à l'aide du séparateur à rouleau.

Par conséquent, la taille des graines influence aux caractéristiques morphologiques des plantes, mais aussi à l'hivernage du blé d'hiver comme un signe de la profondeur du noeud de tallage et de la longueur du point de végétation.

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**LA DEFINITION DES PARAMETRES BIOLOGIQUES
DE LA FERTILITE DE LA TERRE NOIRE LIXIVIE AU
DEPOT DES ENGRAIS.**

Аннотация: В статье представлены результаты исследований по способу повышения показателей плодородия почвы с помощью обработки пожнивных остатков соломы препаратом «Байкал ЭМ 1» и последующей их заделкой в почву. Полученные данные подтверждают повышение содержания органического вещества в 1,3, количества общего углерода и азота в образцах почвы в 1,3 и 1,35 раза соответственно.

Ключевые слова: плодородие почвы, почвенная микробиота, солома.

Le sol c'est l'écosystème et la ressource, diversifiée dans l'espace et sensible aux dégradations par les activités humaines. Les recherches analysent ses fonctions agronomiques et environnementales. Elles portent prioritairement sur les matières organiques du sol, sur les échanges avec les plantes, l'eau et l'atmosphère et sur le fonctionnement des communautés vivantes du sol.

Le sol est un système vivant dont le fonctionnement est déterminant pour la production végétale, l'atmosphère, l'eau et la biodiversité. Il est cependant sujet à des dégradations parfois irréversibles qui menacent à la fois ses fonctions productives et environnementales. Le maintien de la ressource en sol, justifie non seulement d'évaluer ses fonctions, mais aussi de mesurer ses évolutions et de proposer des voies d'amélioration. Le sol ne doit pas être considéré comme un simple support de la production végétale mais comme un patrimoine fragile qu'il faut apprendre à connaître et préserver.

L'augmentation et la préservation de la fertilité des sols est un important problème de la production agricole moderne. Les agrotechnologies modernes sont impossibles sans l'application argumentée des moyens de l'application des procédés chimiques. La place importante occupe l'usage des engrais organiques - le fumier, les composts etc [1].

La décision de ce problème peut être réalisée par l'utilisation de la paille des céréales à titre des engrais organiques. Sur le territoire de la région centrale du tchernoziom de la Fédération de Russie des restes végétaux peuvent être assimilés à tous les restes organiques de l'origine animale. Cependant du temps du labour sans le traitement supplémentaire ils peuvent apporter des infections au sol; les augmentations de la consommation spécifique d'énergie des agrotechnologies auront lieu, à cause de la désagrégation lente de la paille dans le sol; la réduction des réserves tirera son origine de l'azote à la suite du processus de l'immobilisation de l'azote par le groupe des microorganismes [2].

Le but des études – l'augmentation des paramètres de la fertilité du sol à l'épandage de paille traitée par la préparation «Байкал ЭМ 1 – le Baïkal...».

Les buts des recherches :

- étudier l'influence de la préparation «le Baïkal...» sur le nombre total des micro-organismes des sols;

- étudier l'activité biologique du sol sur de différentes variantes de l'expérience avec l'utilisation de la méthode de la dégradation de la toile de lin;

Pour la décision des tâches mises on a fait l'expérience sur la terre noire lixiviée, au contenu augmenté du phosphore et du potassium (le tableau 1).

Le tableau 1. Les paramètres agrochimiques de la terre noire lixiviée dans la place de l'expérience.

Le contenu de l'humus, le %	PH _{kcl}	Mg-eq sur 100 g du sol		V, %	Le contenu de mg/kg	
		Hr	S		P ₂ O ₅	K ₂ O
3,25	5,53	5,6	27,3	80,2	165	94

Le schéma de l'expérience insérait les variantes: 1. Le contrôle, 2. La paille, 3. La paille + «le Baïkal...». Le montant des coupes 1.2 m². La paille était apportée au sol du compte 3t/h. Le traitement de la

paille par les microorganismes se réalisait du compte de 300 l/h de la solution ouvrière.

Les microorganismes utilisant les formes organiques de l'azote étaient élevés aux éléments contenant la viande et le peptone, les actinomycètes et les formes minérales de l'azote étaient définies aux éléments contenant l'amidon et l'ammoniaque. Les microorganismes étaient pris en considération dans le milieu Tchapek. Les azotobacters et les microorganismes (y compris Lipomyces) étaient élevés dans le milieu d'Echbi. Les microorganismes détruisant la cellulose ont été définis dans le milieu de Gettchinson. Pour le compte des formes bacillaires des microorganismes, le mélange a été utilisé: éléments contenant la viande et le peptone + le moût sous la relation 1:1.

Le total des groupes différents des microorganismes est de 10^4 à 1g abs. du sol sec: à la variante de contrôle de 376, avec l'utilisation de la paille égale à 390 et avec l'utilisation de la paille traitée par la préparation «le Baïkal...» égale à 425 pièces.

Pour le compte du changement de l'activité biologique du sol on appliquait la méthode de l'utilisation de la dégradation de la toile de lin. Dans les expériences on définissait le contenu de l'azote (%) total, la matière organique (%) et le carbone (%) sur les normes d'État 26213-91 et 26107-84 (ГОСТ 26213-91 и 26107-84).

Dans le tableau 2 on amène les significations des masses de la toile de lin utilisé à la méthode.

Le tableau 2. La masse des toiles à la méthode après 30 jours

Les variantes de l'expérience	Réitérations			Moyenne	La réduction de la masse de la toile		
	1	2	3		g	%	
						Par rapport à l'initial	Par rapport au contrôle
La masse de la toile initiale				3,70	–	–	–
Contrôle	3,31	3,29	3,39	3,33	0,37	10,0	–
Paille	2,89	2,67	2,72	2,76	0,94	25,4	17,1
La paille + le «le Baïkal...».	2,36	1,83	2,41	2,20	1,50	40,5	33,9
HCP(0,05)					0,33		

Comme on voit des résultats du tableau 2, l'utilisation de la préparation «le Baïkal...» contribuait à la transformation effective de la paille dans le sol. En comparaison de la masse initiale de la toile à

la variante de contrôle on observait le degré insignifiant de la dégradation au niveau de 10 %, en même temps, au dépôt des microorganismes ce paramètre a atteint la valeur 40,5 %. A la variante avec l'utilisation des microorganismes supplémentaires l'augmentation du degré de la dégradation de la paille dans l'alignement avec la variante de contrôle a fait 33,9%.

Les études agrochimiques des modèles du sol ont démontré l'augmentation du contenu de la matière organique dans le sol à l'application de la préparation «le Baïkal...». Dans le tableau 3 on présente les données des paramètres principaux agrochimiques de la terre noire lixiviée après l'application des microorganismes participant à la transformation des liaisons organiques.

Le tableau 3. Les paramètres de la terre noire lixiviée à l'application «le Baïkal...» (en 2 ans)

№	l'humus, %	PH _{kcl}	Mg-équ. à 100 g du sol		C, %	N,%	Le contenu de mg/kg	
			Ca	Mg			P ₂ O ₅	K ₂ O
Contrôle	3,25	5,53	16,3	3,0	1,89	0,17	165	94
Le contrôle + la paille	3,38	5,61	17,5	2,5	1,96	0,18	171	115
Le contrôle +la paille + «le Baïkal...»	4,15	5,54	17,5	1,3	2,41	0,23	173	96

Les données, présentées dans le tableau 3, présentent l'augmentation de la matière organique dans le sol après l'application des microorganismes détruisant les restes végétaux. En comparaison au contrôle le contenu de l'humus à l'application «du Baïkal...» a augmenté de presque 1,3 fois. Les contenus reçus donnés de la matière organique dans le sol se confirment par l'augmentation de la quantité de carbone total et l'azote dans les modèles du sol à 1,3 et 1,35 fois en conséquence.

Ainsi, les résultats des études confirment l'augmentation du nombre total du microbiote du sol plus qu'à 10 %, l'activité biologique de la terre noire lixiviée par le changement de la masse de la toile de lin augmente plus qu'à 30 %.

Les données obtenues témoignent de l'augmentation des paramètres de la fertilité du sol à l'application des microorganismes «du Baïkal...» et peuvent être utilisées par la suite dans les programmes complexes de la préservation et de l'augmentation de la

fertilité des terres noires sur le territoire de la région de Voronej et les sols des autres régions.

Ainsi, à l'utilisation de la paille traitée sur les terres arables de la région de Voronej on peut assurer le dépôt annuel de 8 t/ha des engrais organiques comparable avec le dépôt du fumier et on peut assurer plus de moitié des surfaces occupées par les céréales par l'engrais nécessaire organique en vue de la préservation de la fertilité des sols.

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PLOUGHING IN RIGVEDA

Аннотация: В статье рассматриваются все упоминания выращивания ячменя и пахоты на быках в Ригведе и доказываются, что ригведийские индоарии были и рассматривали себя как типичных пахарей на протяжении всего периода составления древнейшего собрания ведийских гимнов.

Ключевые слова: Ригведа, индоарии, пахота, ячмень, ирригация, земледельческая идеология.

Many eminent Indologists state that Rigvedic Indo-Aryans (further IA) was sedentary soil cultivators. [1] But there are some who insist on the predominantly cattle-herding character of Rigvedic economy. [2] T.Ya. Elizarenkova is of opinion that the invading IA were cattle breeders, with plant cultivation playing much less important and only secondary role in their life, and that the Rigveda (further RV) [3] hymns demonstrate the subduing of non-Indo-European aboriginal ag-

riculturists by IA alongside with the gradual shift of IA from semi-nomadism to the settled soil tillage. [4]

The purpose of this article is to study the references to arable farming in RV and to prove that bull-drawn ploughing was of utmost importance for the IA.

The crucial evidence of IA being plough-men is that the word *kṛṣṭáyaḥ* «people» itself in RV is derived from the root *kṛṣ-* «to plough». [5] As M. Monier-Williams notes, «*kṛṣṭí*, *ayas*, f.pl. ... men, races of men... originally the word may have meant cultivated ground, then an inhabited land, next its inhabitants, and lastly any race of men». [6]

This word is mentioned (including composites) 62 times in RV (I.4.6; I.7.8; I.36.19; I.52.11; I.59.5&7; I.74.2; I.100.10; I.102.7; I.160.5; I.169.2; I.177.1; I.189.3; II.2.10; III.26.5; III.43.7; III.49.1; III.53.16; III.59.1; IV.17.5, 6&7; IV.21.2; IV.30.2; IV.38.2, 9&10; IV.42.1&2; V.1.6; V.19.3; VI.18.2&3; VI.31.1; VI.45.16; VI.46.7; VII.5.5; VII.6.1; VII.19.1; VII.26.5; VII.31.9; VII.82.9; VII.85.3; VIII.5.38; VIII.6.4; VIII.13.9; VIII.24.19; VIII.32.19; VIII.62.2; VIII.68.7; VIII.74.10; VIII.75.10; VIII.92.18; VIII.103.3; IX.69.7; IX.71.2; IX.86.37; X.50.5; X.60.4; X.92.6; X.119.6; X.178.3).

We find it in I Mandala — 13 times, in II — 1, in III — 5, in IV — 10, in V — 2, in VI — 5, in VII — 7, in VIII — 11, in IX — 3 and in X — 5 times; in the Family Mandalas altogether — 30 times, in the ancients part of RV (II—IX Mandalas) altogether — 44 times.

RV does not allow any other understanding of *kṛṣṭáyaḥ* than «plough-men» or «nations of ploughing cultivators» for in all its chronological layers it contains terms derived from the very same root *kṛṣ-* «to plough» which describe the ploughing of barley with bulls (*góbhir yávam ná carkṛṣat*) (I.23.15), the sowing of the field with barley with the bull (*ánu svadhá yám upyáte yávam ná carkṛṣad vṛṣā*) (I.176.2), the ploughing plough (*kṛṣatu láṅgalam*) (IV.57.4), the plowshares cutting up soil (*phálā ví kṛṣantu bhūmim*) (IV.57.8), the urging ploughing bulls on with the song (*vṛṣṇaḥ abhí sobhare girá gáya gā iva carkṛṣat*) (VIII.20.19), the ploughing of barley with the plough (*yávam vṛkeṇa karṣathaḥ*) (VIII.22.6), the ploughing of the plough-land (*kṛṣím ít kṛṣasva*) (X.34.13), the importance of the feeding and ploughing plowshare (*kṛṣánn ít phála áśitam kṛṇoti*) (X.117.7) and woody wil-

derness (Aranyani) as not ploughing, but rich with food Mother of Beasts (bahvannām ákṛṣṭīvalām | mṛgāṇām mātaram aranyānīm) (X.146.6).

Of special significance is the fact that the poets of RV denote as plough-men not only themselves, but also tribes not protected by Agni (ánagnitrā abhí ámanta kṛṣṭīḥ) (I.189.3) and even the Powers of Light with their perfect bodies (kṛṣṭér upamáśya vavrēḥ) (IV.42.1, 2). Also they mention the sowing of seeds and the growing of (vápanto bījam iva dhāniyākṛtaḥ) (X.94.13) grain crop (dhāniyam bījam) (V.53.13). The ripened grain was reaped with sickles (śṛṇiyā (I.58.4); śṛṇiyo (IV.20.5); nédīya ít śṛṇiyāḥ pakvām éyāt (X.101.3)). The flour was put through the sieve (sáktum iva títāunā punánto) (X.71.2).

However it was still a very archaic tradition, for barley was its only cereal crop and the word for barley was also used to denote grain and bread in general. It was given to cattle also (yávam ná paśvá ā dade) (VIII.63.9). Besides already cited mentions of barley growing RV describes ripened (yávo ná pakvó) (I.66.3) barley (yávam) (VII.3.4; VIII.2.3), the sowing of barley with plough (yávam vṛkeṇa vápantā) (I.117.21), the ripening barley (pácyate yávo) (I.135.8), the filling of granary with barley (ūrdaram ná pṛṇatā yávena) (II.14.11), the reaping of barley with the sickle (távéd indrāhām āśāsā háste dátram canā dade | dinásya vā sambhṛtasya vā pūrdhí yávasya kāśínā) (VIII.78.10) and the sorting out of barley by the barley owners during the harvest time (kuvíd aṅgá yávamanto yávam cid yáthā dānti anupūrvām viyūya) (X.131.2), the emptying of some barley containers (nír gā ūpe yávam iva sthivíbhyah) (X.68.3), the overcoming of any famine by means of barley (ṭarema yávena kṣúdham víśvām) (X.42.10=X.43.10=X.44.10).

The archaism of Rigvedic agriculture is also evidenced by the fact that the term yáva, denoting barley, is derived from the very same root as the word for grass in general (yávase) on the pasture-land for feeding domestic animals (paśúr ná yávase) (V.9.4; VI.2.9; VII.87.2) on the flood beds (apáh sūyavasā) (II.27.13) — (milch) cows (gávo ná yávaseṣu (I.91.13; VIII.92.12); dhenúr ná yávasasya pipyúṣī (II.16.8); sá no duhīyad yávaseva gatvī sahásradhārā páyasā mahī gauḥ (IV.41.5=X.101.9); yávasena gāvaḥ (IV.42.10); gávo ná yávase (V.53.16; X.25.1); yásya gāvāv aruṣā sūyavasyū (VI.27.7); yūyam

gāvo prajāvatīḥ sūyāvasaṃ riśántīḥ śuddhā apāḥ suprapāṇé píbantīḥ (VI.28.6–7); dhenúm ná sūyāvase dúduḥṣann (VII.18.4); párā gāvo yāvasaṃ kác cid (VIII.4.18); ūrjaṃ gāvo yāvase pīvo attana (X.100.10); inó ná próthamāno yāvase vṛṣā (X.115.2)), gaurs (sūyavasād bhágavatī hí bhūyā || addhí tṛṇam aghniye viśvadānīm píba śuddhām udakām ācárantī || gaurīr mimāya (I.164.40–41); gaurāv ivānu yāvasaṃ (V.78.2)) and horses (śvo ná yāvase yadā mahāḥ saṃváraṇād ví ásthāt) (VII.3.2) — under the supervision of herders (sugopā yāvasaṃ dhenāvo yathā (III.45.3); góbhīr ná yéṣāṃ gopā áraṇaś cid āsa (V.2.5); gāvo ná yāvasād ágopā (VII.18.10)), as well as wild herbivorous animals (mṛgó ná yāvase) (I.38.5). See also the description of grass fire (drapsā yát te yavasādo ví ásthīran ágne) (I.94.11). In one case we have a description of the typical herding situation: «The cows, being let free, ate the barley. I saw them moving with the cowherds. Hollos sounded at once from every side. For how long will the owner be glad for these? If I intermingle grass-eating (yavasādo) of the men with [those] barley-eating on the spacious field (yavāda uruájre)...» (gāvo yāvam práyutā akṣan tá apaśyaṃ sa-hágopāś cārantīḥ | hávā íd abhítaḥ sám āyan kíyad āsu svápatīś chandayāte || sám yád váyaṃ yavasādo jánānām ahám yavāda uruájre antáh) (X.27.8–9).

As we see the cultivation of barley as a sort of special grass has started comparatively recently and the term for this domestic graminous plant still keeps its genetic relation with the word for herbaceous plants in general. RV fixes the early stage of agricultural development, characterized simultaneously by the bull-drawn ploughing of soil and the minimal quantity of agronomic crops.

In addition to natural river water supply rains were the irrigation sources for the barley fields and grasslands (āgatau yāvo vṛṣṭīva modate (II.5.6); yāvaṃ ná vṛṣṭír ví unatti bhūma (V.85.3); vārdhanti yāvaṃ ná vṛṣṭír diviyéna dānunā (X.43.7); só abhríyo ná yāvasa udanyán (X.99.8)). Where it was necessary, wells dug with shovels or spades (khānamānaḥ khanítraiḥ (I.179.6), ní ṣú dadhidhvam ákhananta útsam (X.101.11)) and having special covers (āvṛtāso avatāso ná kartṛbhis) (I.55.8) and buckets or tubs fastened with straps and with a stone wheel for drawing out the water were used (avatād á nīcād uccā cakrathuḥ pátave (I.116.22); píbā kóśena siktām avatām ná váṃsagas

(I.130.2); ā cyāvayāmo avaté ná kósam (IV.17.16); nír āhāvān kṛṇotana sám varatrā dadhātana | siñcāmahā avatām udrīṇaṃ vayāṃ suśékam ánupakṣitam || íṣkṛtāhāvam avatām suvaratrām suśecanām udrīṇaṃ siñce ákṣitam || dróṇāhāvam avatām áśmacakram áṃsa-trakośaṃ siñcatā nṛpāṇam (X.101.5–7); siñcānti námasāvatām uccācakram ákṣitam (VIII.72.10)). When needed channels with pipes (sūrmī) for river water diversion (saptá síndhavaḥ anukṣāranti kākúdaṃ sūrmīyaṃ suśirām iva) (VIII.69.12) were dug (yá āpo divyā utá vā srāvanti khanítrimā utá vā yāḥ svayaṃjāḥ samudrārthā yāḥ) (VII.49.2) and water-drawing wheels (kūcakreṇeva siñcān) (X.102.11) were utilized.

The plough land is divinized in RV in the form of the Lord of the Field (kṣétrasya pátir) (IV.57.1, 2&3; VII.35.10; X.66.13). The same is with the ploughshare and the furrow (śúnāsīrā) (IV.57.5&8) and separately with the furrow (sītā) (IV.57.6&7). The both words — ‘plough(share)’ (sīra) and ‘furrow’ (sītā) — are derived from the same root sī– ‘to draw (a line)’, the former as an active male agent ‘furrower’ and the latter as a passive female object ‘that which is being furrowed, furrow’. [7] Earth (Prithivi) as Divine Mother’s aspect is asked to be with a perfect womb (siyonā pṛthivi bhava) (I.22.15). This may be compared to the call to the newly-married wife to give birth to the sons and to have a perfect womb (vīrasūr siyonā bhava) (X.85.44). Ploughing and seed-throwing are considered as fertilization of that womb (yunákta sīrā ví yugā tanudhvaṃ kṛté yónau vapatehá bījam || sīrā yuñjanti yugā ví tanvate pṛthak) (X.101.3–4). This again may be compared to the call to the bride describing the process of her fertilization (tām chivátamām érayasva yásyām bījam manuśíyā vápanti | yá na ūrū uśatī viśráyāte yásyām uśántaḥ prahárāma śépam) (X.85.37). As T.Ya. Elizarenkova points out, this mentioning is «one of the early examples in the ancient Indian literature, when a field, being seed-thrown, is compared to the woman’s womb». [8] All this points at a typical agricultural ideology.

Thus Rigvedic IA undoubtedly were and identified themselves as sedentary agriculturists, barley or grain growers and plough-men and used bulls as plough-drawers during the whole period of RV composition.

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ERARBEITUNG UND BEGRÜNDUNG DES EINSATZES VON DÜNGEMITTELN MIT AUFGEGBENE RAHMENBEDINGUNGEN AM BEISPIEL DES LANDWIRTSCHAFTLICHEN BETRIEBES „RIKON“

Аннотация: Для СХП «РИКОН» Панинского района Воронежской области дана агрохимическая оценка плодородия почв, разработана система удобрений в севообороте с заданными параметрами (насыщенность пашни минеральными удобрениями 100 кг/га, экономическая эффективность максимальная). Приведена агрохимическая и экономическая оценка разработанной системы применения удобрений.

Ключевые слова: плодородие почвы, система применения удобрений, эффективность удобрений.

Die Wissenschaft und die Praxis haben bewiesen, dass die Düngemittel eine entscheidende Rolle bei der Erhaltung der Reproduktion der Bodenfruchtbarkeit sowie bei der Steigerung der Produktivität und Produktionsqualität spielen.

In den letzten 25 Jahren ist aber der Einsatz von Düngemittel sowohl im Gebiet Woronesh als auch in ganz Russland auf grund der hohen Preise stark gesunken. Die Regierung unseres Gebiets hat die landwirtschaftlichen Betriebe verpflichtet, die Sättigung des Ackers mit Düngemitteln auf 100kg/ha zu verwirklichen. Das ist kein schlechtes Niveau, aber nicht optimal. Um die Wirksamkeit von den Düngemitteln zu erhalten, ist es notwendig ein spezielles Einsatzsystem zu erarbeiten, dabei ist es erforderlich den Einfluss von Düngemitteln auf die Bodenfruchtbarkeit einzuschätzen und den wirtschaft-

lichen Wirkungsgrad zu errechnen. Es ist längst bekannt, dass die Düngemittel ihren höchsten Wirkungsgrad beim Einsatz im Rahmen eines Systems haben. Das Ziel der vorliegenden Arbeit ist die Erarbeitung des Systems der Düngung in der Fruchtfolge unter den Bedingungen der Ansättigung des Ackers von 100kg/ha.

Zu den Aufgaben der Untersuchung gehören:

1. Einschätzung der Bodenfruchtbarkeit im Betrieb;
2. Optimierung der Düngedosen und das Verhältnis vom Düngemitteln für die landwirtschaftlichen Früchte;
3. Erarbeitung des Düngemittelsystems in der Fruchtfolge mit vorgegebenen agrochemischen und wirtschaftlichen Rahmendaten;
4. Auswahl der besten Form von Düngemitteln;
5. Einschätzung des erarbeiteten Düngemittelsystems.

Es existiert eine große Menge von Methoden der Errechnung von Düngemitteln. Wir haben die Methode des unmittelbaren Einsatzes von Ergebnissen des Feldversuches ausgewählt.

Sie lässt die höchste Rentabilität gewinnen, ist aber nicht ganz genau. Um diesen Nachteil zu beseitigen, haben wir die verbesserte Variante von N.G. Mjasin und P.T. Brehov angewendet. Diese Variante lässt die Menge von Düngemitteln senken, ihr Verhältnis optimieren und ihre Rentabilität steigern.

Die Dosen von organischen Düngemitteln wurden mit Hilfe der Analyse von der Humusbilanz festgestellt. Die agrochemische Einschätzung des Einflusses von erarbeitetem System auf die Bodenfruchtbarkeit wurde auf grund der erweiterten Bilanz von NPK und Humus durchgeführt.

Die Böden im landwirtschaftlichen Betrieb „Rikon“ sind typische Schwarzböden, Mittelhumusschwarzböden, Schwerlehm Böden mit neutralem pH und mit erhöhten Phosphor- und Kaliumgehalt. Wir haben diese Tatsache und die obengestellten Aufgaben berücksichtigt, und es wurde von uns ein System des Düngeeingsatzes in der Fruchtfolge geschaffen. Als Beispiel ist hier das System des Düngemittels in den Fruchtfolge №3 dargestellt Tabelle 1

Tabelle 1 das Düngemittelshema in der Fruchtfolge №3

№ Acker	Kultur	Grundünge- mittel				Dünger bei der Saat					Dünger bei der Vegetation					Jahresdosen			
		Organische Dünge t/ha	Mini- raldünger (Wirk- stoff),kg /ha			Spurelementen	Bakterielle.Dünger	Mini- raldün- ger (Wirk- stoff),kg /ha			N		P 2 O 5	K 2 O	Organische Dünge t/ha	Miniraldünger (Wirkstoff),kg /ha			
			N	P 2 O 5	K ₂ O			N	P 2 O 5	K ₂ O	Wurzel- dünger	Sommer- dünger				N	P ₂ O 5	K ₂ O	
1	Einjährige Gräser	28	-	-	-	-	-	-	10	-	-	-	-	-	28	-	10	-	
2	Winterwei- zen	-	30	43	52	-	-	-	10	-	30	-	-	-	-	60	53	52	
3	Mais (Ge- treide)	-	40	46	52	-	-	-	7	-	-	-	-	-	-	40	53	52	
4	Gerste	-	30	-	-	-	-	-	10	-	-	-	-	-	-	30	10	-	
5	Erbse	-	-	-	-	M o	-	-	10	-	-	-	-	-	-	-	10	-	
6	Winterwei- zen	-	30	43	52	-	-	-	10	-	30	-	-	-	-	60	53	52	
7	Sonnen- blume	-	50	38	52	-	-	10	15	-	-	-	-	-	-	60	53	52	
Insgesamt in einem Zyklus		-	-	-	-	-	-	-	-	-	-	-	-	-	28	250	242	208	
Für 1 ha Acker		-	-	-	-	-	-	-	-	-	-	-	-	-	4	35,7	34,5	29,7	
Verhältnis N: P ₂ O ₅ : K ₂ O		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,0	1,0	0,8	

In dieser Tabelle sind die Jahresdosen je nach dem Ausbringen verteilt. Es sei hervorgehoben, dass wir das Kettensystem des Einsatzes empfehlen. Das trägt zur Steigerung der Wirksamkeit der Düngemittel bei, dabei wird die Nachwirkung der Düngemittel ausgenutzt, deshalb werden die Grunddüngemittel für Gerste und Erbsen in der Fruchtfolge nicht betrachtet, da sie die von den Vorfrüchten gebliebenen Düngemittel gut einsetzen können. Außerdem verwenden wir in unserem Schema die effektivsten Methoden vom Ausbringen (Düngung bei der Saat und bei der Vegetation). Es ist bekannt, dass die Effizienz der Düngemittel mit

solchen Methoden um 1,5-2 Mal höher als bei der Grundmethode ist. Deswegen bekommen alle Mitglieder der Fruchtfolge genug Phosphor - Dünger bei der Saat.

Für das Ausbringen bei der Saat verwendet man einfaches Superphosphat mit niedriger Konzentration sowie Diammophos (für Sonnenblumen).

Zu den Besonderheiten der Düngung von Wintergetreide gehört die Wurzeldüngung (30 kg / ha Stickstoff im ammoniakalischen Salpeter), den in der Frühzeit in den noch nicht erwärmten Boden auszubringen ist. Er soll oberflächlich mit Düngerausbringer oder mit dem Flugzeug ausgebracht werden.

Die Stickstoffdosis soll nach den Ergebnissen der Bodenanalyse geregelt werden.

Die übrig gebliebenen vorgegebenen Düngemittel bringt man bei der Grunddüngung von Wurzeln aus. Für die Grunddüngung verwendet man konzentrierte Düngemittel: Sulfat von Ammonium als schwefelhaltige Düngung, doppeltes Superphosphat und Kaliumchlor.

Organische Düngemittel beabsichtigen wir nur einmal während des Zyklus für die einjährigen Gräser (28t/ha) auszubringen. Das ermöglicht eine gute Humusbilanz.

Für den Einsatz des von uns geschaffenen Systems braucht man organische Düngemittel 4 t/ha, Stickstoff -35,7 kg/ha, Phosphor-34,5 kg/ha und Kalium 29,7 kg/ha, was die vorgegeben Bedingungen (100kg des Wirkstoffes /ha) ermöglichen.

Es gibt nicht genug organische Düngemittel in dem Betrieb, wir empfehlen ein effektives und billiges Mittel- Einmischung von allen zerkleinerten Pflanzenresten mit der Zugabe vom Mineralstickstoff (10 kg Stickstoff für 1 Tonne Stroh).

Zum Schluss kann man sagen, dass die vor dem Gebiet Woronesh gestellten Aufgaben - 100kg des Wirkstoffes /ha für die Ackerfläche – nicht zulässt, die Bodenfruchtbarkeit zu stabilisieren. Stickstoff- und Kaliumgehalt sinkt und beträgt 10,1 und 75,4 kg/ha jedes Jahr.

Es wurde von uns der Einfluss von Düngemitteln auf die Bodenfruchtbarkeit, auf die Bilanz von Nährstoffelementen errechnet. Die Ergebnisse haben gezeigt, dass die Ausnutzung des Systems der

Дüngemittel beim vorgegebenen Ertrag den Entzug von Stickstoff und Kalium nicht sichert. Die Senkung von ihren Vorräten beträgt 10,1 und 75,4. Die Intensität der Bilanz beträgt im Stickstoff -59,6%, Phosphor-97,5% und Kalium-45,5%.

Es ist aber unmöglich die Senkung des Stickstoff- und Kaliumgehaltes auszuschließen und eine hohe wirtschaftliche Effektivität zu erhalten, weil sie sich entgegengesetzt entwickeln. Diese Gegensätze aber kann man wesentlich ausgleichen, wenn man die Intensität der Bilanz vom Stickstoff allein steigert. Das ist entweder auf Kosten der Einführung von Hülsenfrüchten in der Fruchtfolge oder auf Kosten der Zunahme um 30 kg/ha der Frucht- und Sommerdüngung von Winterweizen auf einjährigen Gräsern möglich. Das lässt den Ertrag und die Getreidequalität steigern. Genau so eine hohe Wirkung gibt die Zunahme um 30 kg/ha Stickstoff bei der Grunddüngung für Winterweizen nach Erbsen.

Die von uns durchgeführte Analyse lässt folgende Empfehlungen machen:

1. das Kettendüngesystem einführen;
2. die Düngedosen mit Hilfe den Methoden des direkten Einsatzes von Versuchsergebnissen in der Modifikation von N.G. Mjasin und P.T. Brehov errechnen;
3. bei der Saat das einfaches Superphosphat einsetzen und bei den Grunddüngungen nicht Ammoniakalischen Salpeter, sondern Sulfat von Ammonium als schwefelhaltige Düngung verwenden;
4. auf dem Acker den zerkleinerten Stroh mit der Zugabe von 10 kg Stickstoff für 1 Tonne Stroh liegen lassen.

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LES MALADIES DES ROSES DU JARDIN BOTANIQUE

Аннотация: В статье речь идет о том, что в последние годы особенно остро ощущается потребность в парках. Ежегодно возрастает воздействие вредных веществ на организм человека. Внести гармонию в наше душевное состояние, восстановить утраченную энергию, снизить негативное влияние токсичных веществ могут цветники. Наибольшую популярность и распространение получили розарии.

Ключевые слова. Мучнистая роса, грибы, инфекционный ожог листьев, черная пятнистость листьев.

Dessin 1.La collection de roses du jardin des plantes de Keller



La collection de roses du jardin botanique de B.A. Keller compte dix espèces et quinze variétés qui se destinent par sa beauté unique, par la résistance au gel, par le rythme de croissance et de développement ce qui permet d'admirer ces plantes et d'allonger la végétation de ces plantes délicieuses au printemps, en été et en automne. Depuis l'antiquité la rose est considéré comme la plus belle plante.A l'Egypte an-

cienne on cultivait des roses qui ensuite ont été livrés à Rome. On décorait de la rose des soldats de l'héroïsme à Rome ancienne. Les poètes la chantaient et l'appelaient «la Reine des fleurs» dans la Grèce ancienne. A l'heure actuelle les sélectionneurs ont cultivé plus de quinze milles variétés de roses mais beaucoup d'entre eux sont exposés aux stress.

La rose nécessite un éclairage solaire constant et croît sur des sols bien drainés et fertiles d'un pH de 6.5-7.6. Une violation de n'importe laquelle de ces conditions provoque des maladies non infectieuses et infectieuses qui amènent à la destruction de la fleur. Parmi les maladies enregistrées dans les collections du jardin des plantes, on note: la brûlure infectieuse des branches, la rosée farineuse et la grivelure noire des feuilles. La rosée farineuse frappe les feuilles, les pédoncules et les tiges. A ces endroits apparaît une incursion blanchâtre pareille à une toile d'araignée, composée du mycélium et de la sporulation du champignon. De menus points noirs visibles à l'oeil nu se forment sur le mycélium: les corps fruitiers. Le tissu situé aux sites infectés jaunit, les feuilles se dessèchent.

L'agent stimulant de la rosée farineuse est un champignon hautement spécialisé qui provoque la décomposition des tissus, le dessèchement des feuilles, des pédoncules et des tiges. La source de l'infection: les restes des végétaux frappés par l'infection. [K.I. Rodina, T.N.Selivanova, V.V.Zatyamina, V.D.Pazouchko, p. 20]. Les moyens de lutte sont un élagage phytosanitaire des pointes des plantes en vue de la réduction de l'infection, puis, dix à douze jours plus tard, le traitement régulier par les fongicides suivants: cumulus 0.6 %, anvil 5SK 0.06 %, afugan 30EC 0.05 %, baycor 300EC. [Stanitcheva-2005]. De plus, selon les observations effectuées dans le jardin botanique, il est établi que la rosée farineuse touche plus fréquemment les rosiers grimpants.

Dessin 2. Mildiou ou Blanc du rosier (www.cvetniki.ru)



Ces dernières années, à cause du non-respect des actions phytosanitaires dans les plantations de roses, on rencontre de plus en plus souvent la maladie de la grivelure noire des feuilles. Sur le dos des feuilles, rarement au niveau des pousses, on assiste à l'apparition de grandes taches arrondies, d'abord rouge-pourpre, puis brunes sombres ou noires avec une structure à rayons. Plus tard sur les taches se forment de nombreux corps fruitiers, disposés concentriquement sous la cuticule. Près des taches le tissu de la plante commence à jaunir, puis les feuilles tombent. On observe d'habitude la naissance de nombreux bourgeons dormants qui affaiblissent les plantes et les rendent très sensibles aux basses températures. Le champignon est un parasite faiblement discernable qui endommage les plantes physiologiquement affaiblies à cause de techniques agricoles inefficaces. La maladie se développe fortement par temps pluvieux et modérément chaud, sous une rosée abondante et fréquente. Les moyens de lutte sont: fundazol 50WP

0.1 %, la destruction des mauvaises herbes, le bout des plantes etc. [Jordanka Stanitcheva2005]. La brûlure infectieuse.

Dessin 2. Maladie des taches noires. Les maladies nuisibles des roses du jardin des plantes



Cette infection est visible au printemps après l'enlèvement des protections hivernales. Des taches rouge-brune qui plus tard s'assombrissent sont visibles sur les tiges et les pousses. Elles s'étalent rapidement et entourent les tiges en anneau. Des gonflements, la sporulation du champignon, sont visibles sur les parties mortes de l'écorce. La surface touchée par l'infection se dessèche, le tissu s'atrophie, ce qui provoque la destruction de toute la pousse. Le développement de la maladie est favorisé par une humidité trop importante ce qui se produit souvent sous les protections hivernales.[K.I.Rodina, T.N.Selivanova, V.V.Zatyamina, V.D.Pazouchko, p. 20].

Dans le cadre de la réduction du niveau des techniques agricoles,

des changements de climat et de la gamme limitée des pesticides, la composition des organismes nuisibles change, leur nocivité et leur résistance envers les préparations appliquées augmentent. Aujourd'hui, la protection des plantes prend une nouvelle direction: l'intensification maximale de tous les systèmes naturels protecteurs de la plante agissant aux niveaux physiologique, biologique et moléculaire. C'est pourquoi il faut accorder une grande attention à l'élaboration d'un système de protection des roses écologiquement sûr face aux maladies, avec l'utilisation de préparations à faible toxicité à action de contact et systémique.

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THE INDUSTRIAL WASTES UTILIZATION IN AGROCENOSIS

Аннотация: В результате изучения воздействия отходов пищевой промышленности было установлено, что наиболее благоприятное воздействие на почвенно-биотический комплекс и продуктивность агрофитоценозов оказывали свекловичный жом и бардяной ил. Менее эффективное воздействие оказывал ил в сочетании с лузгой подсолнечника.

Ключевые слова: агроценоз, бардяной ил, картофель, почвенно-биотический комплекс, продуктивность, свекловичный жом, удобрение, лузга подсолнечника.

The problem of ever-increasing number and variety of industrial and consumer waste is the most actual one among the environmental problems in the world and Russia. Every year about 25×10^9 tons of waste are produced in the world and more than 7×10^9 tons in Russia but only 28.6 % of them are reused. It is common practice that wastes are exported to unorganized storage places which occupy more than 100 thousand hectares because of lack of landfills for the disposal and storage of waste products. All this leads to environmental degradation causes pollution of soil, surface water, groundwater, air.

However, the use of organic wastes as untraditional fertilizers in agriculture can solve several problems. On the one hand wastes supply soil with organic matter and available for plant elements, on the other hand waste utilization protects the environment from pollution. If organic wastes are not well prepared some negative processes will develop, such as pollution, nitrification, salinization and alkalization of soils, reducing its biological activity through the development of pathogenic microorganisms, deterioration of water-physical properties, migration of pollutants into groundwater, runoff into surface water reservoirs. So the relevant and actual research task is to develop methods for effective waste management, taking into account the peculiarities of their composition and natural and economic conditions of the region in order to prevent or reduce the negative consequences of organic waste using in agriculture.

The purpose of this research is to evaluate the impact of beet pulp, draff silt and sunflower husk on the soil-biotic complex and potato productivity.

In 2010 the field experiment was conducted in the training center "Agrotechnology" which is located in the forest-steppe part of the Central Chernosem region. The research objects were potato "Impala" (70 thousand tubers per hectare), beet pulp, draff silt and sunflower husk. Organic compositions were applied in autumn 2010 under the main tillage. The experiment was in a crop rotation buckwheat - potato - potato - winter wheat on the area of 24 m^2 , 4th multiplicity, systematic options accommodation.

Observations and analyzes were carried out in accordance with existing procedures and standards.

Pests accounting was made according to 9-point scale,

harvesting was carried out manually, followed by weighing the tubers. The results were mathematically processed by methods of variance analysis on a PC Excel 2000, Statistician 5.5. The starch content was determined by the specific gravity of tubers on weights 500 VLTK. Tasting evaluation was performed by a 9-point scale [2].

Waste products are significantly different from each other by various indicators (Table 1).

Table 1 – Characteristics of industrial wastes

Parameter	Beet pulp	Draff silt	Sunflower husk
Moisture content, %	84,5	88,6	30,6
The pH of the aqueous extract	4,53	4,65	6,20
Organic matter	30,26	47,1	87,3
Ash content	2,96	0,65	3,94
Potassium (K ₂ O) total	0,82	0,69	1,18
Phosphorus (P ₂ O ₅) total	0,32	1,22	0,45
Total nitrogen	2,59	4,02	0,92
C / N ratio	11,7	11,8	41,4

The sunflower husk reaction is alkaline, which provides the neutralization not only soil acidity but physiologically acidic mineral fertilizers acidity as well. The sugar beet pulp and silt reaction ranges admissibly.

Due to C/N ratio 11.7 in pulp it will decompose rapidly in soil as well as silt. The husk decomposition will slow (several years) because C/N ratio is 41.4.

The ash content of sugar beet pulp is 2.96%, draff silt is 0.65%, husk is 3.94. It indicates that the decomposition of organic matter has not taken place yet.

The potassium content of pulp and silt is not significantly different from each other (0.82 and 0.69% respectively). Most high phosphorus content in draff silt is 1.22% whereas in beet pulp and sunflower husk it does not exceed 0.32% and 0.49%. Nitrogen content in draff silt exceeds beet pulp over 64.4% and sunflower husk over 77.1%.

Beet pulp does not contain heavy metals has acidic reaction and refers to the 5th hazard class according to the chemical composition. The draff silt also belongs to the 5th hazard class [3]. Sunflower husk

refers to 4th hazard Class [1].

The disadvantage of these components is their high humidity making it difficult to introduce wastes in soil. So wastes can be mixed with soil or even with sunflower husk.

Positive changes in soil-biotic complex provide increasing the productivity of potato. The excess was 35% over the control if we use beet pulp and 95% if mix silt with husk. The mobil potassium content increased 5 times when we use mixture of pulp and husk in 2012 (Table 2).

Table 2- Impact of industrial wastes on potato yield, t/ha

Variant	Total yield, t/ha		Valuable yield, t/ha		Starch content, %
	2011	2012	2011	2012	Mean value 2011 + 2012
Control	10,1	10,5	6,0	7,5	16,7
Beet pulp	16,0	22,1	10,9	18,4	18,9
Draff silt	15,2	26,7	12,4	23,7	17,4
Silt + husk	8,4	7,5	-	5,1	16,9
Pulp + husk	18,6	22,7	11,9	20,8	17,9

When using a draff silt potato productivity increased by 50.4% in 2011 and 154.0% in 2012. Valuable yield on the variants with organic wastes was twice higher than the reference value in control.

In 2011 potato yields when adding sugar beet pulp, beet pulp with husk composition is higher than the control one up to 58.0% and 84.0% respectively. In 2012 the excess was also significant

But the variant with silt + husk yield value decreased by 17.3% in 2011 and 28.6% in 2012 in comparison with the control one. With simultaneous adding of silt and husk in 2011 the commodity potato was not produced.

Using industrial wastes as alternative fertilizers positively influenced not only its productivity but also the potato quality indicators such as starch. Starch is the most important carbohydrate in the tubers [4].

Beet pulp and silt adding positively influenced the starch content potato. This can be explained by the fact that there were optimum conditions for plant nutrition. The lowest starch content was observed in the control variant and when sunflower husk was used.

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FEATURES OF INDIVIDUAL AGROCHEMICAL AND TECHNOLOGICAL METHODS USAGE AT SOYA CULTIVATION IN THE CENTRAL CHERNOZEM REGION

Аннотация: В статье рассмотрены возможности применения минеральных удобрений и обосновываются отдельные технологические приемы возделывания сои, зависящие от почвенно - климатических особенностей и предшественников в ЦЧР. Представлены сорта культуры, рекомендованные для возделывания в условиях региона.

Soya is a unique crop used for technical, fodder and food purposes. Its chemical composition is very diverse. At high content of amino acid composition, solubility and digestibility of protein (35-40%) grade vegetable oil suitable for use in food, fodder and technical purposes (20-25%), sugar and carbohydrate compounds (20-25%), es-

sential vitamins and vitamin-like compounds (12%), mineral salts (5%), lecithin (2-3.5%), soybean surpasses all other legumes. [5]

World acreage of soybean grain is growing steadily from year by year. At the beginning of the twenty-first century, this crop reached the 4th place in the gross harvest after rice, maize and wheat.

In this country soya is gaining popularity, approaching the sunflower and sugar beet by economic efficiency. The increase of artificial substitutes and growth of protein deficiency, due to the reduction of animal products produced in Russia over the past 15 years, has led to a growing interest and demand for soybeans, as a product of high biological value protein as amino acid composition is similar to soy protein animal protein (content of essential amino acids lysine, histidine, arginine, methionine, phenylalanine and tryptophan - it is almost the same as in the glair).

As a precursor to a number of other superior soy crops. Soya is the best precursor, compared to other crop, wheat, maize and other cultivated plants. This is due to the fact that soy enriches soil with nitrogen and improves its physical condition. [4]

To obtain well-developed plants with grain of high quality, it is necessary to select such areas of cultivation, in which the performance of heat and moisture, the duration of the day, soil pH and soil nutrients were most favorable for the growth and development of soya.

Soya is a heat-loving plant of a short day. However there are now varieties that react poorly to the length of the day, allowing it to grow in the Central Chernozem Region and to obtain good yields. [6]

At different growth phases and development, soya takes different amount of nutrients. However despite this and the existence of critical periods in their consumption, it is weakly reacts to mineral fertilizers. [5]

These features of the crop should be considered in the fertilizer application system, the primarily enabling environment for active functioning of symbiotrophic process. Mineral fertilizers should be used on soil and plant diagnostics. [1,2]

Variety is the biological basis of cultivation technology. It accounts for about 50% of the crop yields increase. [1]

At present the increased demands arise not only to the variety productive capacity, but also to its adaptability to stressful weather conditions (heat, drought, frost, rain and hail), pathogen resistance, reliability and stability for the duration of the growing season. [2]

All home grown varieties, obtain the following qualities: beans resistance to lodging and cracking, seed coat durability, etc.

Following high-yield varieties: Volma, Odessa, Mageva, Belgorod-48, Radiant and others recommended for the CCR.

Soya accumulates nitrogen by means of root nodule bacteria and partly leaving it in the soil (50-60 kg / ha) with root and crop residues. [5]

It also helps to improve agrocenoses as it is resistant to a range of pathogens and pests.

Soya is not very demanding to the predecessors in the rotation. The best are precocious varieties (winter and spring ones) non-leguminous crops. In the Central Chernozem Region soya cannot be sow after sunflower, mustard and rapeseed due to the danger of epiphytotic diseases of common diseases that are harmful to all of these crops.

Another efficient way to increase fertility is to keep moisture, and control weeds, pests and diseases is proper tillage soil. Its effectiveness, particularly for soya, depends on many factors, such as its predecessor, weeds, relief, soil characteristics, weather conditions, and others.

Soil tillage after root crops has its own peculiarities. After the potato and crops of sugar beet harvesting, topsoil (20 cm) remains in a loose state, so the dry autumn soil treated with anti-erosion cultivators to a depth of 12-14 cm. And if the soil moisture is high - the main processing is carried out to a depth of flat 25-27 cm.

Disking along and across the field to a depth of 8-10 cm. is conducted after maize cultivation for green fodder and silage. Right after that post-harvest residues are sealed into the soil with coulter plow at a depth of 25-27 cm. Another feature of soya cultivation after maize is

that the soya seeds are processed by risotorphine, as aqueous extract of maize stems and roots is toxic to nodule bacteria. [6]

Agro-chemical and biological properties improvement helps to solve the problems of fertility and improve phytosanitary condition of the fields.

There is a large number of Russian and foreign high-performance soil processing equipment, used by farmers in the Central Chernozem Region. They help them to cope with all tillage tasks with the greatest efficiency.

At present soya is grown all over the world, even where there are no bacteria of the genus *Rhizobium japonicum*, which fix nitrogen from the air and convert it into plant-available ammonium form. This was realized by the method of inoculation that is by seed treatment for soya by active virulent race of nodule bacteria. Without seeds inoculating this process cannot exist, especially when grown on the new plots. However in the old fields, where soy is grown continuously, there are local populations of rhizobia, which are constantly exposed to biotic, abiotic and anthropogenic influences that does not allow them to create a sustainable population.

High symbiosis activity depends on many factors such as soil moisture content (60-70% of the total soil moisture), soil looseness, the reaction of soil solution (6.5-7.5), soil and air temperature etc.

In the Central Chernozem Region the topsoil there is enough nitrogen for the initial growth of soya. By the time of the active element consumption this legume makes it up by biological fixation from air by symbiosis with rhizobia. [6]

Phosphate and potash fertilizers are applied during the basic soil tillage based on the result of soil diagnostics. Their doses are calculated by balance method of concerning its consumption.

Micronutrients (boron, manganese, cobalt, molybdenum, zinc, copper and others.) are essential nutrients. All the processes of synthesis, decomposition and metabolism in the plant take place with them. They also affect photosynthesis activity, accelerate the development of plants, increase productivity, and others. Microfertilizers are ap-

plied during preliminary treatment of seeds or plants by foliar application. [3]

Most varieties cultivated in the Central Chernozem Region ripen late in August and mid-September. They do not lodge and crack but have low attachment of beans.

In this regard, desiccation is carried out at beans lower and middle tiers browning and seed moisture content not higher than 40-45%.

Desiccation accelerates ripening for 7-10 days, dries weeds and facilitates harvesting, reduces grain moisture, thereby reducing the cost of their drying and save the seeds quality. Harvesting is carried out 7-10 days after desiccation. In certain years by desiccation can be replaced sanicula (5% solution of ammonium nitrate) which also accelerates soya ripening for 4-7 days, increases the yield and protein content in seeds.

Delay of harvesting terms and rules of preparation and use of harvesting equipment leads to loss of harvest (up to 15-30%), injury (20-25%) and microreversibility (up to 35-40%) of soybean seeds. The higher the degree of the seeds microreversibility, the lower is their germination. To prevent the losses, the cut height should not exceed 7-8 cm.

Thus agronomic and processing methods of soya cultivation in the Central Chernozem Region are the key to obtain high yields and reduce the losses.

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LUNG CANCER AS THE ISSUE OF OUR TIME.

Аннотация: Современная медицина обладает мощным спектром диагностических мероприятий. Вместе с тем актуальной остается необходимость разработки скрининговых методов, отвечающим следующим требованиям: неинвазивность, невысокая стоимость. В настоящее время активно разрабатываются методики неинвазивной диагностики рака легкого. Одним из направлений является анализ выдыхаемого пациентами воздуха.

Ключевые слова: Рак легкого, диагностика, неинвазивные методы, выдыхаемый воздух, газовый анализ, сенсоры.

At present lung cancer is one of the most actual problems of clinical oncology, as it is the most common cause of death among all malignant diseases in many countries of the world. Each year lung cancer kills about 1 million people in the world [1]. This is due to the steady increase in the incidence of lung cancer, difficulties of its (op-

portune, seasonable) diagnostics. In addition, in most cases the lung cancer is diagnosed later at locally spread process and metastases occurrence.

Diagnostics of lung cancer is quite a difficult problem. Tumors often masquerade as other lung diseases (pneumonia, abscess, tuberculosis). Over 50% of lung tumors are diagnosed on large, neglected and inoperable stages. The initial stage of the tumor and sometimes some types of the neglected tumors not manifest any symptoms and are diagnosed only by chance or with the development of complications. To avoid this, it is necessary to identify the symptoms early stages of the disease and prevent its development, to identify the causes of formation cancer cells.

The incidence of lung cancer in many countries has a steady tendency to growth over the last 50 years [2]. Currently in most developed countries, lung cancer is the most common form of cancer in men and is one of the most important medical and socio-economic problems. Annually more than 1 million new cases of lung cancer in the world are recorded, 58% are in the developed countries [3].

The highest morbidity rates are observed in North America and Europe, they are somewhat lower in South America, Australia and some parts of East Asia. The morbidity among men is more than 3 times higher than among women. Annually 921 thousand deaths from lung cancer are recorded in the world.

In 2000 more than 63 thousand people suffered from lung cancer in Russia. The number of deaths has increased over the 20-year period by 40% and reached 58.9 thousand. The proportion of lung cancer in the structure of deaths from malignant neoplasms was 30.8% in men and 6.6% in women, occupying respectively the first and the fourth place.

A small difference in the average age of morbidity (64.7) and dead (65.1) is a consequence of the unfavorable prognosis of this form of tumor characterized by high one-year mortality [4]

Modern medicine has a powerful range of diagnostic measures. However there remains the need to develop screening methods that

meet the following requirements: non-invasiveness, low cost, the ability to perform procedures by general practitioners and others. To one such methods is used. Modern ideas on the human body the analysis of the exhaled air theoretical form basis of this trend as an open, self-regulating system maintained by the coordinated activity of all those in close interaction and hierarchical subordination of functional systems. Therefore the change in the structure and functional activity in any part of the body spreads to all other subsystems. Thus the exhaled air is closely linked to the processes occurring in the body, which formed the consideration of the results of their **detection** as a valuable diagnostic tool [5].

The molecular composition of the exhaled air comprises at least 600 volatile and non-volatile compounds. They as well as blood and other biological waste products contain information on the functional state of the human body due to natural chemical transformations coming from the environment in the internal organs of the air molecules and food. It was found that about 20 of the most sensitive to changes in the functional state of organism the exhaled air molecules can be used as natural biomarkers (objects of diagnostics) of a number of diseases [6, 7]. To identify such substances physico-chemical methods such as gas chromatography (GC), mass spectrometry combined with gas chromatographic separation (MS-GC), electrochemical sensors (OH), semiconductor sensors (IR), UV-chemiluminescence method (WPHL) and infrared spectroscopy (IRS) are used. The latter includes Fourier transform spectroscopy (FTS), photo acoustic spectroscopy (SLA) and laser spectroscopy (PP) [8].

Conclusion

Based on the literature data on the use of different methods of highly sensitive detection of gaseous molecules of biomarkers in the exhaled air, it can be concluded that the instrumental analysis of trace gaseous compounds in the exhaled air is an important and promising approach for the development of new methods of research and diagnostics in biomedicine. Sensor matrixes with software signal processing in the devices like "electronic nose" are efficiently applied.

The idea of involving gas analysis for the diseases diagnosing is approved by medical community due to the obvious advantages: non-invasive, security, ease of sampling and monitoring many biochemical processes in the human body.

Thus the exhaled breath analysis is a promising *diagnostic* method for screening of lung cancer, which needs further investigation.

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BODENVERDICHTUNG ALS URSACHE VON VERMINDERTER FRUCHTBARKEIT

Аннотация: во время обработки тяжелыми орудиями создается повышенное давление на почву, что негативно сказывается на плодородии и последующих урожаях. Существует ряд причин, из-за которых происходит это негативное явление. Колеса машин имеют недостаточную площадь опоры, чтобы избежать уплотнения верхнего слоя почвы, а вместе с проскальзыванием, приводят к развитию эрозии и низкой водопроницаемостью. Вопрос снижения вредного уплотнения почвы возник с момента бурного развития интенсивного земледелия и не потерял своей актуальности в настоящее время.

Ключевые слова: вредное уплотнение почвы, снижение плодородия, нагрузка на почву.

In der Broschüre „**Bodenverdichtungen vermeiden Bodenfruchtbarkeit erhalten und wiederherstellen**“ von Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen wurden die wichtigsten Punkte über Bodenverdichtungen berührt und einige Tipps für richtige Bodenbearbeitung gegeben.

„**Die Bedeutung des Bodengefüges**“ beinhaltet den Bodenaufbau, der die Summe der unterschiedlich großen Teilchen eines Bodens umfasst. Diese Bodenteilchen werden nach ihrer Korngröße in Sand, Schluff und Ton unterteilt. Die Sandpartikeln haben einen Durchmesser von 2 bis 0,063 mm, Schluffpartikeln eine Größe von 0,063 bis 0,002 mm.

Die Größe der Sand-, Schluff- und Tonpartikeln wirkt sich auf die Lagerung der Bodenteilchen zueinander aus.

Die Poren – die Zwischenräume zwischen den Bodenteilchen – können mit Wasser oder Luft gefüllt sein. Es gibt Primärporen, die mit der natürlichen – primären – Lagerung der Bodenteilchen entstehen. Die Größe der Primärporen wird hauptsächlich durch Form und Größe der zusammenlagernden Bodenteilchen bestimmt. Diese Umstände haben Einfluss auf die Fähigkeit des Bodens, Wasser zu speichern oder versickern zu lassen.

Um den Verdichtungszustand und die Verdichtungsempfindlichkeit eines Bodens bestimmen zu können, muss – über die Bodenart hinaus – das Bodengefüge betrachtet werden.

Das Bodengefüge, das heißt die Struktur eines Bodens, wird nach der räumlichen Anordnung der Bodenteilchen zueinander bestimmt und hat großen Einfluss auf die Bodenprozesse. Das Bodengefüge beeinflusst den Wasser- und Lufthaushalt sowie die Wachstumsbedingungen für Pflanzen maßgeblich. Es bestimmt auch die Tragfähigkeit eines Bodens.

Die Bildung eines Bodengefüges ist von vielen Einflussgrößen abhängig, die durch die Landwirte nur teilweise beeinflusst werden können.

Dazu gehört

- die Bodenart

Die Bodenart hat durch Form und Größe der Bodenteilchen entscheidenden Einfluss auf die Gefügeform.

- die Ton-Humus-Komplexe und Lebendverbauung

Humus, bzw. organische Substanz, ist durch seine Funktion als Nährstoffspeicher und -quelle, Wasserspeicher und Bindeglied zwischen Bodenteilchen äußerst wichtig für ein stabiles Bodengefüge.

- das chemisch-physikalisch bestimmte Aneinanderlagern und Auseinanderdriften der Bodenteilchen. pH-Wert beeinflusst die Bindungen zwischen den Bodenteilchen positiv und fördert eine lockere, aber stabile Bodenstruktur.

- die Frostwirkung,

- die Schrumpfung und Quellung,

- der Zeitraum der Bodenentwicklung,

- die Bodenbearbeitung selbst.

Die Landwirtschaft nimmt durch Bearbeitung und Befahrung den größten Einfluss auf die Bodenqualität.

Ursachen von Bodenschadverdichtungen

Bodenschadverdichtungen entstehen durch Belastung oder Beanspruchung des Bodens über dessen Eigenstabilität hinaus.

Die häufigsten Ursachen für Bodenschadverdichtungen in Folge von Bewirtschaftung.

Zu auslösenden *externen Faktoren* zählen:

- die Radlast ist ausschlaggebend für die Tiefenwirkung der Belastung, während der Kontaktflächendruck besonders die Belastung im Oberboden bestimmt.

- der Kontaktflächendruck,

- die Überrollhäufigkeit: da sich mehrfache Überfahrten in Ihrer Wirkung verstärken, hat die Anzahl der Überfahrten ebenfalls eine große Bedeutung für die Entstehung von Bodenschadverdichtungen.

- Schlupf/Scherung wirkt stets in Kombination mit Auflast stark auf den Boden ein.

Zu *Ursachen* von Bodenschadverdichtungen gehören:

- Bodenbearbeitung bei feuchtem Boden

- falsch eingestellte Bodenbearbeitungsgeräte

- abgenutzte oder fehlkonstruierte Schare

- Fahren in der Furche beim Pflügen

- Fahren auf frischgepflügtem, feuchtem Acker ohne vorherige Rückverdichtung

- Befahrung von feuchtem Boden

- Radlasten

- Transportfahrzeuge mit normaler Straßenbereifung auf dem Feld

- Staunässe durch verstopfte oder beschädigte Drainagen und natürliche Abflüsse

- zu hohe Viehbesatzdichten bei feuchter Witterung und ungenügender Regenerationszeit der Flächen fördern Verdichtungen in den oberen Zentimetern des Bodens.

Neben diesen externen Faktoren, die den Boden belasten, gibt es zahlreiche interne Faktoren, welche eine Dichtlagerung bis zu einem gewissen Grad verhindern können.

Zu den *internen Faktoren* zählen:

- Bodenart,
- Aggregatstabilität,
- Humusgehalt,
- Lagerungsdichte,
- Gefügestruktur,
- Porengrößenverteilung,
- Kalkgehalt,
- Wassergehalt.

Auch gibt es Faktoren, die *besonders betroffene Flächen* einflüssen:

- Vorgewende
- Fahrgassen
- Feldmieten
- Weiden mit zu hohem Viehbesatz bei hoher Bodenfeuchte
- Vernässte Stellen
- Krumenbasis

Faktoren, die Bodenschadverdichtungen begünstigen:

- geringer Humusgehalt der Bodens
- wenig organische Substanz als Nährstoffquelle für Bodenlebewesen

- wenig Bodenleben
- Kalkmangel

Die Folgen von Bodenschadverdichtungen können folgende sein:

- Verringerung der Grobporen
- Vernässung der Bestände
- geringere Auffüllung des im Boden gespeicherten Wassers und des Grundwassers.
- vertrocknete Bestände
- der Wurzelraum wird verkleinert

- die Nährstoffaufnahme der Pflanzen sinkt
- Regenwürmer treten in schadverdichteten Böden seltener auf
- Erosion wird durch die verringerte Wasserinfiltration begünstigt und mit ihr die Nährstoffabspülung.

- Stickstoffverluste

All diese Faktoren wirken einer nachhaltigen Sicherung der Bodenfruchtbarkeit entgegen und führen zu einem höheren Betriebsmitteleaufwand, um das gewohnte Ertragsniveau eines Standortes zu erhalten.

„**Erkennen von Bodenschadverdichtungen**“ enthält die Information über Bodenuntersuchung.

Anhand des Gefüges (Bodenstruktur), der Lagerungsdichte, des Wurzelwachstums, der Bodenfarbe, des Bodengeruchs und der mit bloßem Auge sichtbaren Porenanzahl kann auf den Zustand des Bodens geschlossen werden.

Die Bestimmung des Humusgehaltes mittels Laboruntersuchungen gibt wichtige Aufschlüsse über den Zustand des Bodens und den Erfolg der durchgeführten Bewirtschaftungsmaßnahmen im Blick auf die Bodenfruchtbarkeit.

Mit der Handsonde oder dem Penetrologger wird der Eindringwiderstand des Bodens gemessen. Je höher der Widerstand ist, desto dichter ist der Boden gelagert.

Im Labor können weitere Untersuchungen anhand der im Feld genommenen Proben erfolgen.

Mit den gestörten Proben werden unter anderem analysiert:

- pH-Wert,
- Bodenart,
- Carbonatgehalt (Kalk),
- Nährstoffe,
- Dichte der Festsubstanz
- Feinporenanteil.

Die Dichte der Festsubstanz wird zur Berechnung des Gesamtporenvolumens (GPV), also aller vorhandenen Porenräume, verwendet. Die Untersuchungen an Stechzylindern geben Auskunft über:

Porengrößenverteilung, Luftkapazität, Wasserleitfähigkeit, Luftleitfähigkeit.

Die Bewertung der Laborergebnisse in Kombination mit den im Feld aufgenommenen Daten kann mit Hilfe des Indikatorenmodells erfolgen.

Bodengefüge erhalten und verbessern

Will man die Bodenfruchtbarkeit erhalten, muss man Schadverdichtungen entgegenwirken.

Die klassischen Maßnahmen zur Vermeidung von Bodenschadverdichtungen hängen eng mit der Befahrung und Bearbeitung des Bodens zusammen:

- Verringerung des Kontaktflächendrucks zur Schonung des Oberbodens durch Vergrößerung der Reifenaufstandsfläche
- Verringerung der Radlast
- Verringerung des Radschlupfes
- Verringerung der Anzahl an Überfahrten
- Verringerung der befahrenen Fläche
- Bodenbearbeitung nur bei trockenem Boden
- Einstellung der Bodenbearbeitungsgeräte

Neben den klassischen Maßnahmen zur Vermeidung von Bodenschadverdichtungen existieren *weitere Maßnahmen*, die im Zusammenhang mit der Bodenfruchtbarkeit stehen:

- Verbleib von Ernteresten auf der Fläche
- Anbau von Zwischenfrüchten
- Gestaltung der Fruchtfolge unter phytopathologischen und bodenverbessernden Gesichtspunkten
- Organische Dünger mineralischen vorziehen
- Optimale pH-Werte des Bodens gewährleisten
- Verringern der Bearbeitungsintensität

Zudem gibt es *weiterführende Hilfsmittel*, die zur bodenschonenden Bewirtschaftung herangezogen werden können:

- Klimadaten
- Wetterdaten
- Bodenfeuchtemessungen vom Geologischen Dienst

- Bodenkennwerte
- Computerprogramme/Berechnungsmodelle

Und wenn der Boden bereits dicht ist?

Sollte der Boden bereits verdichtet sein, so stehen die Beseitigung der Schadverdichtung sowie die Ermittlung ihrer Ursachen im Fokus. Der nächste Schritt besteht darin, das Ausmaß der Bodenverdichtung zu ermitteln, um hieraus zu wissen, welche Meliorationsmaßnahmen in dem betreffenden Fall am sinnvollsten eingesetzt werden können.

Zu beachten ist, dass dauerhaft erfolgreiche Bodenmeliorationen bei Schadverdichtungen schwierig zu realisieren sind.

Es gibt verschiedene Konzepte, die im Zusammenhang mit verdichteten Böden angewandt werden können.

Für die *mechanische Tiefenlockerung* stehen verschiedene Geräte zur Verfügung. Der Einsatz jedes Tiefenlockerungsgerätes setzt einen trockenen Boden voraus – trocken bis zum tiefsten zu bearbeitenden Punkt.

Um nachhaltigen Erfolg zu erzielen, muss eine Lockerung immer von einer biologischen Stabilisierung begleitet werden.

Starre Tiefenlockerungsgeräte wie Tiefenmeißel sind aufgrund der geringen Lockerungswirkung wenig geeignet. Den größten Schaden richtet jedoch ihr Einsatz bei ungünstigen Bodenverhältnissen an. Gleiches gilt für Untergründer am Pflug.

Zu einer Melioration von Bodenschadverdichtungen gehört daher nicht nur die Lockerung, sondern zwingend auch die biologische Stabilisierung des Bodens im Anschluss daran. Diese erfolgt durch die Einsaat von mehrjährigen Klee-grasgemischen, Luzerne, Rotklee, Steinklee und anderen Pflanzen, deren Wurzeln einerseits tief in den Boden eindringen und andererseits ein dichtes Geflecht ausbilden, das den Boden stabilisiert.

Integration der biologischen Stabilisierung in den Betriebsablauf

Für ökologisch wirtschaftende Betriebe ist die Regeneration vielfach einfacher in den Betriebsablauf zu integrieren.

Nach der Melioration

Nach einer tiefen Bodenlockerung muss bei der Befahrung der Fläche auf die Maschinenausstattung geachtet werden.

Die *Maschinen und Geräte*, die während der biologischen Stabilisierung und danach auf der Fläche eingesetzt werden, müssen *nach den Kriterien*

1. geringe Kontaktflächendrücke (große Reifenaufstandsfläche) und
2. niedrige Radlasten ausgewählt werden.

Die Anzahl der Überfahrten muss zudem so weit wie möglich reduziert werden. Befahrung und Bearbeitung dürfen nur bei optimaler Bodenfeuchte stattfinden.

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***Секция II. Актуальные проблемы механизации
сельского хозяйства и переработки
сельскохозяйственной продукции***
***Secyion II. Urgent issues of agricultural mechanization and
product processing***

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**WIRKUNG VON MECHANISCHEN SCHWINGUNGEN AUF
DEN MENSCHEN**

Аннотация: во время работы оператора мобильных энергетических средств он подвергается различным вредным воздействиям. Большое негативное влияние оказывает транспортная вибрация, что приводит не только к возникновению неприятных ощущений и, соответственно, снижению производительности труда, но и может вызвать серьезные отклонения в состоянии здоровья. На данный момент этот вопрос занимает важное место и требует новых решений.

Ключевые слова: транспортная вибрация, механические колебания, оператор мобильных энергетических средств.

Da die Fahrzeugführer von Ackerschleppern ihre Tätigkeit normalerweise im Sitzen ausführen, gelten die nachfolgenden Ausführungen für den sitzenden Menschen. Der menschliche Körper wird hier aufgrund der Schwingungseinleitung über das Gesäß Schwingungen ausgesetzt, die sich über den gesamten Körper erstrecken, und deshalb als *Ganzkörperschwingungen* (GKS) bezeichnet werden. Zu unterscheiden sind diese von Schwingungen von Teilsystemen des menschlichen Organismus, wie z.B. *Hand-Arm-Schwingungen*, wie sie ein Fahrzeugführer durch das Umgreifen des Lenkrads erfährt.

Die Effekte von Ganzkörperschwingungen lassen sich unterteilen in:

- akute Wirkungen
- biomechanische Reaktionen
- physiologische Reaktionen
- Befindensstörungen und Schmerzwahrnehmungen
- Leistungsminderungen
- chronische Wirkungen durch Gesundheitsschädigung.

Akute Wirkungen

Die einwirkenden Schwingungen können den Körper oder Teile desselben, wie Magen oder Augapfel, zu Resonanzschwingungen anregen, was zur Entstehung einer hohen biomechanischen Belastung der schwingenden Körperteile und des umgebenden Gewebes führt. Die Eigenschwingungsfrequenzen einzelner Organe wie Herz, Nieren, Magen liegen zwischen 2 und 8 Hz, einem Frequenzbereich, der durch Vertikalschwingungen ungefederter Fahrzeuge besonders angeregt wird. Auch die Resonanzfrequenz bestimmter Skeletteile (Wirbelsäule, Becken) liegt in diesem Bereich.

Davon unabhängig sind GKS aber auch für rein physiologische Veränderungen des Körpers verantwortlich, wie

- Muskularbeit, um den Körper zu stabilisieren und den Schwingungen entgegenzuarbeiten,
- erhöhte Atemfrequenz und Sauerstoffverbrauch, was nur teilweise mit der vermehrten Muskularbeit erklärt werden kann.

Die Beeinträchtigung der Sinneswahrnehmungen durch GKS sind von ihrer Entstehung her nicht klar zwischen biomechanischen und physiologischen Ursachen zu unterscheiden. Am weitesten untersucht sind Auswirkungen auf die visuelle Wahrnehmung. So steigt beispielsweise bei einer Schwingungsbelastung mit einem Effektivwert von 1 m/s^2 und Anregungsfrequenzen zwischen 1 und 80 Hz die relative Auffassungszeit für Zahlenkombinationen um durchschnittlich 800%. Ebenso sind kompensatorische Augenbewegungen zur Zielverfolgung nur bis etwa 2 Hz in vollem Umfang möglich.

Die Signale dieser zeitweisen Veränderungen des Körpers werden vom Gehirn aufgenommen und dort zur Wahrnehmung der Belastung verarbeitet. Dies bedingt eine meist negativ empfundene Befindlichkeit, die bei Überschreiten einer gewissen Stärke bis zum Schmerz führen kann .

Sensumotorische Leistung: Die genannten akuten Effekte auf den menschlichen Organismus lassen erwarten, dass die sensumotorische Leistungsfähigkeit von Fahrzeugführern sinkt. So konnte *Dupuis* nachweisen, dass bei simulierten LKW- Schwingungen mit einem Effektivwert von 2 m/s^2 das Vermögen zum Nachfahren einer bestimmten Strecke (tracking-test) signifikant abfällt.

Bei diesen Leistungsbeeinträchtigungen muss zwischen der direkten mechanischen Wirkung auf das Hand-Arm, bzw. Fuß-Bein-Steuersystem und der psycho-physiologischen Wirkung unterschieden werden. Während die eine nach Ende der Schwingungsbelastung sofort aufhört, kann die letztere weiter andauern und die Ausführung von anschließenden Tätigkeiten beeinträchtigen .

Gesundheitsschädigungen

Neben den akuten Wirkungen von GKS treten auch chronische Schädigungen auf. Da deren Erforschung jedoch immer auf epidemiologischen Studien basiert, sind diese Erkrankungen wenig spezifisch und schwer nachweisbar, da sie auch bei Personen auftreten, die nicht zur Risikogruppe gehören. Es wirken demnach verschiedene Einflussfaktoren aus Beruf und Freizeit gemeinsam.

Wirbelsäulenerkrankungen

Die Wirbelsäule ist durch GKS besonders beansprucht, da die Einleitung der Schwingungen beim sitzenden Menschen über das Gesäß direkt in die Lendenwirbel erfolgt. Die Zwischenwirbelsäuleabschnitte der unteren Lendenwirbelsäule sind schon während des normalen Tagesablaufs erheblich belastet. Anhaltende Kompression und dauerhafte Schwingungsbelastung beeinträchtigen den Stoffwechsel im Bandscheibengewebe. Damit werden degenerative Veränderungen eingeleitet bzw. beschleunigt .

Unter Belastung durch GKS erhöht sich der Druck in den Bandscheiben um ein Mehrfaches. So führen insbesondere Reso-

nanzschwingungen des Rumpfes und in der Wirbelsäule im Frequenzbereich zwischen 3 und 5 Hz nicht nur zu vertikalen Relativbewegungen zwischen den Wirbelkörpern sondern zusätzlich zu Rotationsbewegungen der Segmente und zu horizontalen Segmentverschiebungen. Stosshaltige GKS stellen eine noch größere Gefährdung dar. Es können dabei Kompressionskräfte erreicht werden, die feine Risse in den Deckplatten der Wirbelkörper verursachen.

Die am Bandscheibengewebe eingetretenen Schäden sind irreversibel. Es kommt zu einem Prozess, wo u.a., infolge der Veränderungen an den Bandscheiben und den Wirbelkörpern sowie durch die Instability in den Bewegungssegmenten schmerzhaft Beschwerden und Funktionsstörungen im Bereich der Lendenwirbelsäule auftreten.

Der Frequenzbereich zwischen 3-5 Hz ist jedoch in vielen ungefederten Fahrzeugen vorherrschend. Deshalb sind besonders Fahrer von mobilen Arbeitsmaschinen von Wirbelsäulenschädigungen betroffen. Bei längerfristigen, wiederholten Belastungen treten daher degenerative Veränderungen der Lendenwirbelsäule in dieser Berufsgruppe häufiger auf, was Gegenstand zahlreicher Untersuchungen ist.

So führten z. B. *Schulze* und *Poister* (1979) eine epidemiologische Studie mit 155 Traktoristen und Landwirten mit durchschnittlich 15 Berufsjahren durch. In klinischen und röntgenologischen Untersuchungen wurde festgestellt, dass degenerative Skeletterkrankungen im Bereich der Brust- und Lendenwirbelsäule bei der Risikogruppe etwa sieben bis zwölf Jahre früher als bei der Durchschnittsbevölkerung auftraten.

Eine generelle Aussage, ab welcher messbaren Schwingungsbelastung eine dauerhafte Schädigung der Wirbelsäule eintritt, kann aufgrund der Vielzahl der Einflussfaktoren (Alter, Körperbau, Konstitution, Sitzhaltung, Stoffhaltigkeit, Exposition) bisher jedoch nicht getroffen werden. Dennoch hat der Gesetzgeber mit der Einführung der Berufskrankheit *BK2110* (1992) auf das Gesundheitsrisiko bei Einwirkungen von GKS reagiert.

Zu den anerkannten Berufsgruppen, bei denen die Berufsgenossenschaften beim Eintreten dieser Krankheit aufkommen muss, zählen Fahrer von

- Baustellen-LKW
- land- und forstwirtschaftliche Schlepper
- Forstmaschinen im Gelände
- Gabelstapler auf unebenen Fahrbahnen
- Militärfahrzeuge im Gelände

Magenerkrankungen

Neben den Erkrankungen der Wirbelsäule werden bei Personen, die längerdauernden GKS ausgesetzt sind, oft Beschwerden und Erkrankungen im Bereich des Magens festgestellt. Es treten neben akuten Befunden, wie Magensenkungen (Gastroptosen) und Gastritis auch chronische auf, die vor allem anatomische und funktionelle Veränderungen des Magens betreffen (Geschwüre). Der Magen wird bei GKS zu Resonanzschwingungen zwischen 4 und 5 Hz angeregt, was als ein Faktor zur Entstehung dieser Erkrankungen angesehen wird. Darüber hinaus legt jedoch die Mehrfachbelastung von Maschinenführern am Arbeitsplatz (Lärm, klimatische Bedingungen, unphysiologische Ernährungsweise, psychische Belastung usw.) die Vermutung nahe, dass es sich um einen multifaktoriellen Entstehungskomplex handelt.

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TECHNICAL DIAGNOSTICS OF AGRICULTURAL MACHINERY

Аннотация: Приведены методы технической диагностики. Рассмотрена вибрационная диагностика, как наиболее современная и эффективная. Представлен обзор измерительных преобразователей.

Ключевые слова: Техническая диагностика, вибродиагностика, измерительные преобразователи, пьезоэлектрический преобразователь, информация, измерение, техническое состояние.

Reliability of the results of technical diagnostics of agricultural machinery is an indicator that determines the effectiveness of further repairs and maintenance, so technical diagnostics agricultural machinery contributes to resource conservation in agriculture, as it provides a rational use of material, technical and human resources system maintenance and repair in agriculture.

Methods of vibration diagnostics [1] aimed at the detection and identification of malfunctions of the unit, which influence its vibration: defects rotor support system and stator assemblies, etc., experiencing or generating dynamic loads. First, use the methods and means of control of various parameters, and then monitoring and the last stage - a system of diagnosis and prognosis of a technical condition. The introduction of each subsequent type of system provides the user with new opportunities to go to the maintenance of machinery and equipment for the actual condition [2, 3].

Vibrodiagnostics gives specific and reliable diagnosis, which in turn ensures reduced costs for maintenance and recovery unit, improving service quality and longer service life

On the basis of the diagnosis determines the best mode of operation of the unit in a fault condition and the technology to eliminate the defect and restore functionality of the unit.

Diagnosing the condition of machinery and assessment of the risk of damage on the basis of vibration control – one of the most effective methods to increase the reliability of the equipment [3].

Vibratory diagnosis objects is carried out in three stages: an initial description of the vibratory state of the object, feature extraction and decision making.

When measuring vibration parameters using two methods of measurement: kinematic and dynamic.

Kinematic method lies in the fact that the measured coordinates of the object relative to the selected fixed coordinate system. Transducers based on this method of measurement, called transducers relative vibration.

The dynamic method is based on the fact that the vibration parameters are measured relative to a fixed reference frame artificial, in most cases, the inertial member connected to the object through an elastic suspension. Such devices are called absolute vibration transducers, most seismic systems.

Value converters vibration into an electrical signal is divided into two classes [4]: generator, converting mechanical energy into electrical oscillations (piezoelectric and electromagnetic converters); parametric (inductive, capacitive and eddy current), which convert mechanical vibrations in the change of the parameters of electric circuits, for example, inductance, capacitance, resistance, frequency, or phase shift, etc.

Piezoelectric transducers are used for measuring absolute vibration of rotating parts are not mechanisms. Piezoelectric transducers have high metrological characteristics, broad amplitude and frequency range, high reliability and relatively low cost. Their main drawback is the high output impedance and low noise immunity [4]. To a lesser extent, these disadvantages are inherent piezoresistive transducers belonging to the class of parametric converters. Methods of vibration diagnostics [1] aimed at the detection and identification of malfunctions of the unit, which influence its vibration: defects rotor support system and stator assemblies, etc., experiencing or generating dynamic loads.

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EMPFANGS - UND VERTEILEREINRICHTUNG IM GETREIDEREINIGER

Аннотация: В статье дан анализ и классификация приемно-распределительных устройств зерноочистительных машин. Рассмотрены их преимущества и недостатки.

Ключевые слова: зерноочистительная машина, приемно-распределительное устройство, гравитационный, принудительный, комбинированный.

Zu den wichtigsten Funktionen der Empfangs- und Verteilereinrichtung gehören die Abnahme des Produkts von der Verkehrsverbindung und die Ausrichtung des Stroms nach der Breite der Triebeinrichtung. Für Druckluftzylinder und Siebe als verbreitete Einrichtungen des Getreidereinigers ist die Ausrichtung des Stroms nach der Breite notwendig. Ungleichmäßige Zuführung des Produkts nach der Breite der Luftsiebsreinigung führt zum Scheidungsabsinken des Getreides im Luftstrom und zur überflüssigen Wirkung der metallischen Flächen auf die einzelnen Körner in der unterbelasteten Zone, d.h. sie dient der Vermehrung der Getreidebeschädigungen von den Einrichtungen des Reinigers. In den überlasteten Zonen führt das zum Qualitätsabfall der Scheidung. Bei der ungleichmäßigen Belastung nach der Siebsbreite fällt die Durchsiebensqualität ab. Das hat den Produktivitätsrückgang des Getreidereinigers, die Verlustvergrößerung, den Qualitätsrückgang des gereinigten Getreides, die Verschlechterung der Stabilität in der Arbeit der Fließreihe zur Folge [2].

Die Gleichmäßigkeit der Getreideverteilung gehört zu den wichtigsten Faktoren, die die Durchlaßfähigkeit der Siebe beeinflussen. Wenn der Variationsgrad der ungleichmäßigen Belastung nach der Breite um 10% größer wird, dann macht der Produktivitätsrückgang 122 kg/h aus. Deshalb ist die gleichmäßige Belastung der Triebeinrichtungen für die Hochleistungsarbeit des Getreidereinigers sehr notwendig [1].

Wir haben vorhandene Einrichtungen, die für die Zuführung und die Verteilung des Getreides verantwortlich sind, betrachtet und diese in drei Gruppen gegliedert, und zwar die Empfangs- und Verteilereinrichtungen mit der Zwangswirkung, mit der Gravitationswirkung und mit der kombinierten Wirkung.

In den Empfangs- und Verteilereinrichtungen mit der Zwangswirkung wurde Getreidematerial nach der Breite der Empfangskammer verteilt und zu den Triebeinrichtungen des Reinigers mit Hilfe der aktiven Triebeinrichtungen befördert (Schneckenförderer, Transportwalze, Rüttelrinne u.a.). Dank der aktiven Triebeinrichtungen verteilt sich das Getreide gleichmäßig nach der Breite der Triebeinrichtungen des Reinigers. Sie ermöglichen einen guten Fluss des Gutes aber dabei wird das Getreide stark beschädigt [1].

Die Verteilereinrichtungen der Trommel-, Rüttel-, Band- und Schneckenarten kann man als Empfangs- und Verteilereinrichtungen mit der Zwangswirkung klassifizieren. Die Verteilung der Körner in der Empfangskammer vollzieht sich in der Regel mit Hilfe der Schneckenförder, und die Getreidezuführung – mit Hilfe der Förderwalzen, Schnecken, Rüttelrinnen und Förderbänder.

Zu den Nachteilen der Schneckeneinrichtungen gehört auch das, dass sie beim Klappenanschlag präziser eingestellt werden müssen. Es gibt die Notwendigkeit oft zu prüfen, ob die Klappe an Haube dicht liegt. Die gefährlichsten Empfangs- und Verteilereinrichtungen (im Sinn der Körnerbeschädigung) sind die Einrichtungen mit dem Schneckenförderer besonders mit der Druckwirkung [4].

In den Empfangs- und Verteilereinrichtungen mit der Gravitationswirkung läuft die Verteilung des Gutes nur auf Kosten der Gravitationskräfte. Solche Empfangs- und Verteilereinrichtungen haben den Vorteil, dass sie das Getreide fast nicht beschädigen. In der Regel werden diese Empfangs- und Verteilereinrichtungen mit der Gravitationswirkung nur für eine sekundäre Reinigung des Getreides verwendet [1].

Zu den Empfangs- und Verteilereinrichtungen mit der Gravitationswirkung gehören Abfallteiler, Bunkereinrichtungen mit der Gravitationsklappe. Die Abfallschlitzteiler werden wegen ihres unkomplizierten Aufbaus und keiner Beschädigung der Körner verwendet. Obwohl diese Einrichtungen sicher sind, ist ihre effektive Arbeit nur bei der kleinen Produktivität möglich.

Bunkereinrichtungen der Empfangs- und Verteilereinrichtungen mit dem gewichtsbelasteten oder gefederten Ventil finden Verwendung in den Reinigern, die keine große Breite der Triebeinrichtungen haben. Da diese Maschinen keine aktiven Triebeinrichtungen haben, ist das Prozent der Körnerbeschädigung ziemlich klein. Diese Anlagen speichern aber das Getreide über das Ventil statisch auf. Deshalb haben sie eine Tendenz zum portionierten Auslassen der Getreidemasse, was ihr großer Nachteil ist [5].

In den Empfangs- und Verteilereinrichtungen mit der Gravitationswirkung ist es schwierig, das Getreide nach der Breite gleichmäßig zu verteilen, weil sie nur mit den Streugütern funktionieren, die schon durch die primäre Reinigung bearbeitet wurden [1].

In den Empfangs- und Verteilereinrichtungen mit der kombinierten Wirkung wird die Verteilung innerhalb der Empfangskammer von den aktiven Triebseinrichtungen und von der Zuführung von Gravitationskräften gesichert. Auf dem Boden der Empfangskammer von diesen Einrichtungen gibt es ein Gravitationsventil, das sich unter dem Einfluß der Schwere des Getreidehaufens öffnet, der innerhalb dieser Kammer ist [4].

Die Empfangs- und Verteilereinrichtungen mit der kombinierten Wirkung finden in den Getreidereinigern sowohl der primären Reinigung, als auch der sekundären Reinigung ihre Verwendung [3].

Die Gleichmäßigkeit der Belastung in der Zeit und nach der Breite hängt von verschiedenen Faktoren ab und zwar von dem Aufbau der Ladung- und Verteilereinrichtungen, von der steuernden Wirkung dieses Speisungssystems (Klappenöffnung, Höhe der Speicherschicht im Bunker, Gang der Speisewalze, der Schnecke u.a.), von der Art des Getreides und von den Mittelwerten ihrer Eigenschaften [6].

Auf Grund der durchgeführten Literaturanalyse können wir Schlussfolgerungen ziehen, dass die Anwendung der Empfangs- und Verteilereinrichtungen mit der kombinierten Wirkung die Belastung der Triebseinrichtungen des Getreiderreinigers verbessern und die Beschädigungen des Getreides verringern kann.

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THE ANALYSIS OF REQUIREMENTS TO COLLECT AND STORE THE FULFILLED MERCURY-CONTAINING LAMPS

Аннотация: Представлены требования, предъявляемые при сборе и хранении отработанных ртутьсодержащих ламп.

Ключевые слова: ртутьсодержащие лампы, утилизация, упаковка, ртутные отходы

A container for collecting and storage of mercury-containing lamps are the whole cardboard boxes of lamps such as LB, DRL, cardboard, plywood boxes, boxes from chipboard, plastic and paper bags.

Temporary storage of the fulfilled mercury-containing lamps should be organized in a separate warehouse. The warehouse is in a well-ventilated room. The accumulated, worked-out mercury-containing lamps are sent to the factories recovering mercury wastes. [1,2].

The storage conditions of worked-out mercury-containing lamps.

The main condition for replacement and collection of ORTL is a preservation of containment. Collection of ORTL should be done in the place of their formation separately from ordinary garbage and strictly separately basing on the methods of conversion and dehydration. During the collection all the lamps are classified by their diameter and length.

After the packing of ORTL into the container for storing they should be put into a separate plywood or particleboard box.

A separate box should be used for each type of the lamp. Every box should be marked (you should name the type of the lamp – a mark, a length, a diameter, maximal amount which should be put into a box).

Lamps should be put into a box closely together. The room designed to store ERTL should be spacious (not limiting movements of a man with outstretched arms), have an opportunity to be ventilated. You should also have purge ventilation.

The room for ORTL storage, should be removed from domestic rooms, the floor should be made of waterproof, not sorption material, preventing the ingress of harmful substances (in this case mercury) into the environment.

Broken lamps should be collected in plastic bags immediately, be tightly tied and placed into cardboard or plywood boxes. Collection and package of broken lamps should be provided with the use of means of individual protection of respiratory organs.

For dissolution of some accident caused by the destruction of a large number of lamps, in order to prevent adverse environmental effects in the location where you stored ORTL, you should have a 10 liters capacity water tank of and a stock of reagents (manganese potassium).

There is an act about the broken lamps which is written in unofficial form where the type of the broken lamps, quantity, date of incident, place of incident is indicated.

It is prohibited to store lamps:

- alfresco and in places, where children have an access to;
- without any container;
- in a soft cardboard boxes, stacked on each other;
- lamps on the soil surface.

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«LEAN PRODUCTION» PROCESS AT THE ENTERPRISES OF MOTOR TRANSPORT AND AGRICULTURAL MACHINERY MAINTENANCE

Аннотация: В статье рассматривается внедрение системы «бережливого производства» на предприятиях по техническому обслуживанию автомобильного транспорта и сельскохозяйственных машин. Рассматриваются проблемы методов устранения всевозможных потерь, которые возникают на таких предприятиях.

Ключевые слова: бережливое производство, технический сервис, автомобильный транспорт, сельскохозяйственные машины.

For Russia the main, the key challenge is the low efficiency. Russia is more than two times lower than the developed countries by labour productivity. In the coming years, labour productivity in Russia should grow two times faster than now. The only way is to overcome the gap in efficiency [1]. These words said by President Putin are before as relevant as ever. The main task of the technical service companies is to increase productivity. “Lean production” helps to solve this problem without serious financial investment.

Lean manufacturing enterprise management system is based on the constant pursuit of the elimination of all kinds of production and non-production losses. Lean manufacturing involves the incorporation in the process of optimizing the workflow of each employee and its orientation to the maximum result.

In accordance with the philosophy of lean production all activities of the enterprise technical services is divided into operations and

processes that have value to the customer (which the customer pays), and has no value for him, which consume enterprise resources and facilities. The goal of the “lean manufacturing” is systematic reduction of the processes and operations that do not have values, reaching thus freeing up the resources to increase their productivity.

Usually “lean manufacturing” is perceived as a system that provides the development of enterprises based on the construction of a uniform, flexible and fast flow. This can be done if to avoid all the flour losses, thus making production more efficient. Eliminating the losses, we release the resources (human, material). These resources should be used for the development of enterprise technical services.

The creation of effective enterprise technical services will require the definition of the main purposes, which are necessary to optimize production, namely:

- Formation of tangible and intangible goals in the technical service company;
- Identification of the potential staff and training needs;
- Detection of time losses in operations and processes;
- Elimination of time losses in operations and process optimization;
- Optimization of the cost of spare parts and consumables;
- Implementation of technical services waste management;
- Optimization of personnel requirements and equipment.

The system of "lean production" provides tools for solving the problem of increasing the revenue of technical service companies. These are mapping processes, drawing a stream, lean logistics (shipping of spare parts at the right time and in the right place), inventory management for building and configuration of the core providing flows; the optimal balance of production, visual management planning to optimize production planning.

For the flow of execution of works to be as fast as possible, it is necessary to build the so-called cell - space flow, where there is a continuous flow without in-process inventory. For this purpose it is necessary to apply the tools of the organization of working space:

- standardization of operations;
- load balancing workflow;

- providing components, at the right time and at the right moment.

Identification and elimination of wastes in operations will help to increase the productivity of labor. Analyzing the timing diagrams of the personnel movement in the operation, as well as focusing on the concept of the process value, we find the problem, identify the root causes of these problems and then using different tools and techniques. The improved process is described by the standard, which specifies not only the sequence and duration of the activities, and key characteristics of the operations that affect the quality of the process and product.

Knowing and understanding the optimal number of resources per unit of work you can calculate the optimum personnel to fulfill the existing orders. Working according to the standards, employees will be able to execute all orders at the right time.

We considered the assessing staff performance in practice making the “photo of the working time” of the employee using the Method of Spaghetti. The Spaghetti diagram is a simple and very effective method to evaluate the losses of employees.

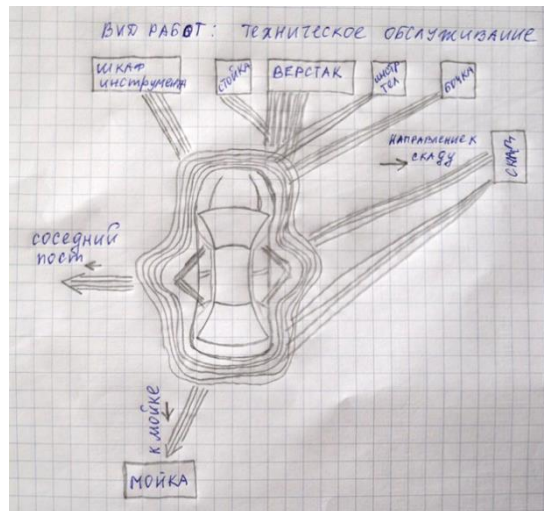
“Spaghetti” chart (spaghetti chart is a visual tool that allows to describe the trajectory of the employee, car, tools, etc. The name is connected with the fact that the chart often looks as spaghetti moving with traces of sauce on the plate.

Consider an example from practice at the technical service enterprise carrying out routine maintenance of a car. The following plan necessary to build such a chart will be developed:

1. to start with, the object was selected, in this case the performance of technological operations by a mechanic working on the post;
2. on an ordinary sheet of paper, we marked the items that fall in the working post (post, the car being on it, the truck with tools, spare parts and consumables);
3. from the very beginning, we watched the movement of the mechanic and count his steps;
4. we will study the movement of the personnel especially "re", "extra". Technology costs required to complete the cycle times can be

estimated. For us it is certain operations maintenance (post cleaning, the movement of people in the shop and so on). The employee may move at different distances, move to the spare parts and consumables warehouse, search of the tool, movement for the issuance of a special tool.

Figure 1 - Chart of the employee movements before the change. 1929 steps. 140 minutes



We created a chart of the personnel movement and fix all the movements as lines (figure 1). As a result the time of counting and distance traveled by the mechanic get that for maintenance was spent 140 minutes of time and 1929 steps completed by the employee while performing work.

The “Spaghetti” chart data (figure 1) show a considerable loss of time due to frequent moves to the warehouse, workbench, etc.

To mitigate these losses a number of simple recommendations for the process improvement were developed:

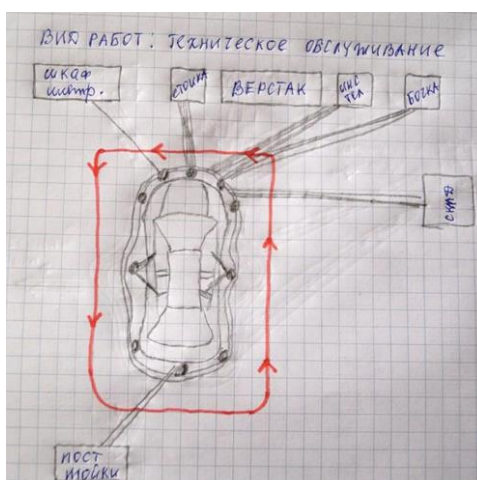
1. To provide standardization process of the maintenance work execution, including the preparation of necessary tools and proper workplace.

2. To introduce a system of preliminary selection of spare parts and materials this includes a set of parts prior to arrival of the car at the post.

3. To implement the delivery of spare parts directly to the post by a warehouse employee.

4. Additional work must be correlated in advance.

Figure 2 - Chart of the employee movements before the change. 1929 steps. 140 minutes



We will teach the staff involved in the process the new changes of the process and maintenance preparation. After the training process we will new observations will be conducted. Register mechanic movement (figure 2) counting the number of steps 1119 steps and 109 minutes of time. According to the registration map mechanic moves in cycles, consistently checking the checkpoint. They are marked with circles.

During the following factors have changed workflow changeover:

- the number of steps decreased by 40%, the execution time decreased by 28%;
- the quality of the works performed thereby improved mechanic checked all the required units from the registration form;
- the time required to perform the operations due to their standardization reduced;
- working staff tired less;
- the opportunity for the use of the released time for the additional services increases;
- sales of spare parts and consumables due to the sale of additional services requiring materials increases.

Another important task is to ensure stable operation of the equipment with maximum efficiency in a narrow place of the production flow. Here the system of the equipment maintenance will be of great help. This system consists of two stages: daily and scheduled services. Daily service consists of visual inspection and cleaning of the equipment at when the working shift end. Routine service is carried out in the stipulated time according to the schedule the maintenance service.

When implementing the principles of “lean production” on the enterprise of technical services its operations by standardization of work processes is optimized. The hidden capabilities of the staff are revealed by its comprehensive involvement in the workflow. The resource consumption of the enterprise by changing workflows optimized. The quality of the work performed improves.

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THEORETICAL STUDY OF SEPARATE AGROTECHNICAL METHODS OF THE SUNFLOWER SEEDS PREPARATION FOR SOWING IN AGROCLIMATIC CONDITIONS OF THE SOUTHERN AREA OF VORONEZH REGION.

Аннотация: В статье даётся теоретическое обоснование отдельных агротехнических приемов подготовки семян подсолнечника к севу в агроклиматических условиях южных районов Воронежской области.

Ключевые слова: агроклиматические условия, подсолнечник, технологические приемы, предпосевная обработка.

Agroclimatic conditions of the southern area of Voronezh region are characterised by a number of adverse factors for sunflower at the initial stage of its development. They are: lack of rainfall during sunflower sowing, high air and soil temperatures that is essentially reflected in shoots density, and as a result - uneven maturing of a crop. [1]

Sunflower is the most widespread oil crop in the territory of Voronezh region. It occupies 78% of the cultivated areas under oil crops and 86% of gross oil crops yield of the country. [2]

Chemical processing of sunflower seeds with growth stimulators have a number of shortcomings. It is necessary to consider high toxicity and high cost of preparations. However, processing of seeds with chemicals such as growth stimulators, does not promote plants resistance to stress and increase of shoots density.

Russian and foreign scientists introduce new environmentally friendly techniques into the production process. Biologically active preparations and those containing microelements are applied. With their help growth processes in seeds become more active, viability and productivity being increased.

Research of such methods of the seeds sowing qualities increase showed insufficient study of these questions.

The research on the basis of the references revealed that both in theory and in practice there are various recommendations about technology of preseeding preparation of seeds and ways of their germination stimulation. [4]

For strengthening the seeds «health» it is necessary to apply physiologically active agents. They will be efficient in case they are easily available to a germ (V. V. Butkevich (1959). Various factors influence the germ physiological condition directly or indirectly. They «work» in biologically active range and are efficient only if treated seeds were treated, showed high rates of laboratory viability.

Despite the abundance of researches and projects, techniques and processing methods, the majority of them differ in the increased cost, labor input, and lack of ecological approach to the development and subsequent functioning of ecosystems.

In this regard, search and choice of ecologically balanced and safe reception of sunflower seeds preparation for sowing. It did not only promote the density of seeds and shoots germination of the crop,

but also promoted resistance to stress both sprouts and plants in the conditions of adverse agroclimatic conditions. It also allowed excluding ecologically unsafe reception of desiccation from the standard technology of Voronezh region. [3]

That in our opinion is immersion of seeds in solutions of various chemicals for a long time (soaking). It is one of the most recommended methods of preseeding processing of seeds. In this case closer contact with seeds is carried out, and substances become more available.

However actual in this process is the opportunity to use the equipment available in farms, in particular protector of seeds if processing is carried out indoors, or simple attachments are put on the sowing unit and processing is carried out directly in the field which will not demand difficult technical solution.

The effect of various factors on sunflower seeds, their germination, safety of useful fauna of a field ecosystem, soil fertility for the subsequent crop rotation, definition of optimum doses of bacterial, biological products, terms, ways of seeds complex preparation including the increase of the seeds sowing humidity, study of their properties at adaptation and as a consequence, resistance to stress of sprouts and shoots to adverse agroclimatic conditions of the southern regions of Voronezh region are of great interest both for theory and practice.

Having carried out the analysis of standard production technologies of sunflower seeds in Olkhovatsky and Rossoshansky areas, on the example of the farm of IE «Kovtun» of Voronezh region and 10 - year dynamics of agroclimatic conditions, we revealed average terms of sunflower sowing which are in the second – the third decades of April. Terms of sowing are defined depending on air temperature, readiness of the soil, moisture content and other conditions. The most amicable shoots can be produced if sowing is carried out in twelve days after spring soil processing, at air temperature from +15 degrees and soil temperature at a depth of 8 cm from +10 degrees.

Seeds of high-olive grades of sunflower and sprout germinate at the soil temperature from +8 degrees if to sow them earlier, seeds can partially lose the viability, and the shoots will turn out irregularly. Comparing of terms of the crop sowing moisture and temperature, condition of the territory, it should be noted that high rates of air temperature (from +19 do+27) and very low moisture is characterized by total absence of atmospheric precipitation during the sowing period.

Despite the fact that for the majority of crops agroclimatic factors of the southern regions are in general favorable since they correspond to the standard technologies applied by the majority of farms, earlier terms of their sowing, compared to sunflower when reserves of soil moisture and both soil and environmental temperature are favorable for seeds germination during sunflower sowing average monthly temperatures of May are close to June indicators and are +24-25° C.

Sunflower harvesting take place at the end of September - November - in the period of atmospheric precipitation in the region, in connection with the process of the seeds ripening in the field, owing to chemical desiccation of the seedlings. Thus harvesting is prolonged and seeds often lose necessary qualities. This demands additional costs for drying.

So the research objective is the development of processing methods and improvement of means of mechanization at sunflower preseeding preparation based on the material processing by biological products and increase in sowing humidity for providing plants resistance to stress, yield quality, reduction of losses and ecological safety in agroclimatic conditions of the southern area of Voronezh region.

The issue touched is actual, however it needs to be practically confirmed. Technico - technological solution should be developed.

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PREPARATION DES GRAINES DE SARRASIN A L'AIDE DU PHOTOSÉPARATEUR

Аннотация: предложен способ исключения из зернового вороха гречихи трудноотделимых примесей. Приведены результаты исследований очистки гречихи на фотосепараторе.

Ключевые слова: гречиха, зерновой ворох, очистка, качество, травмирование, фотосепаратор.

Les entreprises de traitement distinguent les mélanges des céréales par taille, par des propriétés d'élasticité aérodynamique, par coefficient de frottement, etc. Il est question de la séparation des grains d'un tas, lorsque les impuretés ont les mêmes propriétés physiques et mécaniques avec un produit facile à vider. Les noyaux de sarrasin diffèrent à part entière de ses grains de couleur, ce qui permet d'appliquer avec succès le photoséparateur pour la préparation de céréales ou de graines.

Les grains de sarrasin sont très fragiles et peuvent être détruits, broyés et transformés en farine avec un peu d'effets mécaniques. Il est donc important de réduire les effets mécaniques sur les céréales à la récolte et lors de traitement du sarrasin après la récolte. Pour cela, lors de la récolte du sarrasin, il est recommandé d'appliquer des moissonneuses-batteuses qui font blesser la masse moins que le tambour de moissonneuses-batteuses. [1] On propose un traitement après la récolte par une machine à air et à tamis suivi d'un tri par le photoséparateur.

Le photoséparateur est conçu pour séparer les composants du

grain du tas de cultures différentes par la couleur ou la transparence aux étapes de traitement final avec propreté jusqu'à 99,99%. Le photoséparateur ne blesse pas les céréales.

Des études ont été menées pour évaluer la qualité du nettoyage des grains d'un tas à l'aide du photoséparateur. Plusieurs échantillons de grains des tas de différentes qualités ont été traités avec le photoséparateur Ph.10.1 (Φ10.1) de la Société par Actions de type ouvert «Voronejselmache» (ОАО «Воронежсельмаш»).

Lors du traitement de chaque échantillon des graines décortiquées étaient identifiées, ainsi que la perte du premier cycle de nettoyage. Dans la perte du premier cycle de nettoyage ont été trouvés de véritables grains de sarrasin. Pour réduire entièrement la perte du premier cycle de nettoyage, les grains au départ sont traités avec le photoséparateur et, comme résultat, on obtient deux fractions : celles raffinées de départ et celles de départ définitif – le fourrage.

Le pourcentage des fractions obtenues lors du nettoyage avec le photoséparateur, est donné dans le tableau 1.

Tableau 1 - Le rapport des fractions dans le milieu d'origine.

Le numéro d'échantillon de test	Le rapport des fractions, %			
	les graines décortiquées	la perte du premier cycle de nettoyage	la fraction raffinée de départ	la fraction pour le fourrage
1	78,7	21,30	15,80	5,50
2	85,10	14,90	13,17	1,73
3	77,28	22,72	16,67	6,05
4	91,87	8,13	6,13	2,00
5	77,88	22,12	18,87	3,25
6	91,9	8,10	6,44	1,66
7	74,80	25,20	14,99	10,21
8	89,53	10,47	9,23	1,24
9	83,59	16,41	12,52	3,89
La valeur moyenne	83,41	16,59	12,65	3,95

Le tableau 1 montre que les graines décortiquées représentent en moyenne 83,41% du tas d'origine, la perte moyenne du premier cycle de nettoyage s'élève à 16,59% des grains d'un tas; la quantité de déchets atteint une moyenne de 12,65%, et le fourrage représente en moyenne 3,95% de la masse de la récolte d'origine.

Le contenu des blés dans les graines décortiquées a diminué en moyenne de 7 fois, et les impuretés – de 2,3 fois. Cette pureté des graines obtenue ne dépasse pas 99%, ce qui satisfait aux exigences de la norme d'État (GOST R 52325 - 2005). [2]

Au cours des recherches, il s'est avéré que le fourrage contient des grains entiers de sarrasin. Le tableau 2 montre la composition du fourrage en pourcentage de la masse de la récolte d'origine.

Tableau 2 - Composition du fourrage.

Le numéro d'échantillon de test	Le pourcentage en tas d'origine, %		
	Le grain entier	Le grain blessé	Les impuretés
1	5,21	0,17	0,12
2	1,57	0,07	0,08
3	5,15	0,63	0,27
4	2,36	0,42	1,41
5	0,91	0,99	0,10
6	2,97	0,09	0,19
La valeur moyenne	3,03	0,39	0,36

Le tableau 2 montre clairement que le grain entier dans le fourrage est en moyenne de 3,03% de la masse d'un tas d'origine, des céréales endommagées représentent 0,39% et les impuretés - 0,36% de la masse de la récolte d'origine. Il s'est également avéré au cours de la recherche que le grain entier dans le fourrage a beaucoup moins de poids de 1000 grains, que dans les graines décortiquées et nettoyées, les rebuts (tableau 3).

Tableau 3 - Poids de 1000 grains obtenus de fractions.

Le numéro d'échantillon de test	Poids de 1000 grains de fractions, grammes		
	Les graines décortiquées	Les rebuts	Le fourrage
1	32,16	31,79	29,78
2	28,09	26,80	22,68
3	27,99	26,32	24,40
4	27,44	25,86	23,13
5	28,23	26,93	25,36
6	29,68	27,81	23,27
La valeur moyenne	28,93	27,59	24,77

Le tableau 3 indique que la masse de 1000 grains entiers parmi les graines décortiquées est en moyenne de 28,93 gr., dans les graines nettoyées et les rebuts – de 27,59 gr. Dans le fourrage, le poids de 1000 grains est beaucoup moins important, il est en moyenne de 24,77 gr.

Avec la diminution de la masse par 1000 grains diminue le contenu du noyau dans la sélection de céréales, c'est-à-dire le fourrage se distingue essentiellement de grain biologique défectueux. [3] Cela signifie que, des grains mûrs tombent dans le fourrage. Si l'on considère que le fourrage n'est pas détruit, il peut être utilisé pour le distribuer aux animaux, ensuite – comme des grains mûrs dans le fourrage valide.

Par conséquent, les résultats d'études ont montré que l'application du photoséparateur permet de préparer des semences de qualité, répondant aux exigences de la norme d'état, de ne pas nuire à la matière. Lors de ce peu de perte, de grains entiers constituent les grains mûrs, ayant de mauvaises semences de qualité.

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REDUCING OF SEALING IMPACT OF SUSPENSION SYSTEM THE MACHINE-TRACTOR UNIT ON THE SOIL

Аннотация: Современные технологии возделывания сельскохозяйственных культур предусматривают выполнение большого количества операций. В качестве энергоносителей используются мощные энергонасыщенные тракторы. Масса таких сельскохозяйственных агрегатов очень большая, а многократные их проходы по полю вызывают значительное уплотнение почвы. Переуплотнение почвы отрицательно сказывается на её плодородии и снижает урожайность сельскохозяйственных культур.

Ключевые слова: агротехнические требования, переуплотнение почвы, упругодемпфирующий механизм.

Intensive technologies based on multiple passes of powerful heavy tractor units, combine harvesters, technological and heavy vehicles are increasingly used in agricultural production. It was found that such technologies negatively affect soil and vegetation, excessively compacting the soil. Every year this problem becomes more acute and urgent, as the anthropogenic impact on the soil grows.

Due to soil compaction pore volume is reduced air-water regime is broken, runoff increases, water erosion develops. In the process of sealing soil structure is destroyed at the upper layers, the roots penetration in the lower horizons is hindered nutrients remain unavailable to plants, microorganisms deterioration decreases [1,2]. Manifested deterioration of the fundamental soil properties must be compensated by intensive processing, application of the increased doses of fertilizers, irrigation which for a short period masks the degradation, i.e., violation of soil fertility reproduction.

To solve this problem ecological compatibility of agricultural machinery with the environment should be performed, i.e. in carrying out agricultural work favorable soil conditions must be provided. The technologies he uses should improve the soil bearing capacity and reduce its sensitivity to the chassis pressure on the soil. It is possible to avoid excessive soil compaction due to the passage of heavy equipment the designers efforts.

Most studies [4,5] on the improvement chassis interaction with the support base are aimed at improving the qualities of towing vehicles, rational acquisition of tractor units for work in different environments, rational choice of operating speeds, use of modular design principle, etc.

Not only agronomist should deal with this operation. Soil compaction is very important to the tillers. It causes an increase in the growth of the draft resistance. With the energy increase saturation and the unit working speeds levels of random fluctuations increased. The intensity of the dynamic processes has a significant impact on the unit operational performance. Emerging perturbations are due to uneven field interaction of working tools to the material: intensified vertical

vibrations that increase the load fluctuation on the hook. These fluctuations affect the engine performance, lead to fluctuations in the core, as all chassis of modern tractors have an elastic suspension and cause largest stress variables [4,5].

Fluctuations in the tractor core that arise at high dynamic loads make the tractor driver working conditions worse. The caused strain decreases the units service. Such variations cause working bodies deviations from the velocity vector longitudinal axis, whereby their resistance increases.

Fluctuations in the traction load and resistance force cause propulsion slipping. Slippage affects the operational and technological performance of the machine-tractor unit (reduced productivity and patency, improvement in specific fuel consumption, tire wear) physical and biological soil properties [1,2].

Thus a vicious circle is formed: dynamic load on the tractor chassis by soil compaction affects unit vertical oscillations, chassis vibrations lead to soil compaction.

A way to solve the problem is to install the elastic vibration dampers in the elements and units of the machine tractor unit.

Various scientific studies [4,5] have shown that the introduction of elastic coupling in separate tractor mechanisms (transmission, wheels, trailed and mounted devices, in fixing the working bodies of agricultural units) reduces the dynamics processes. Special elastic-damping elements mounted in the driven clutch disc or elastic actuator drive wheels are most widely used. The efficiency of elastic-damping mechanisms in the transmission is that they contain elements which elastically deform, absorb, dissipate energy fluctuations traction load, reducing the dynamic loading of the drive, slipping the movers, etc.

There are many design solutions aimed at reducing the dynamic loads in the transmission and improvement of the engine operation conditions. In publications [3,5] there is a diagram and description of the elastic-damping mechanisms installed in the unit transmission. The designed elastic-damping mechanism can significantly improve the operational performance of the machine-tractor unit and reduce the

chassis impact on the physico-biological and physico-mechanical properties of the soil. The design of the elastic element is protected by several copyrights and patents.

The proposed elastic-damping mechanism in the transmission is «frequency filter». It attenuates the vibrations acting on the engine from external impacts in a certain frequency range. The load fluctuation is caused by the type of tractor unit work and non-uniformity of physical and mechanical soil properties.

There is a reduction of slipping propulsion and as a result the reduced impacts on soil by the machine-tractor unit system, due to effective damping of vertical oscillations appearing on the uneven field and interaction of working tools to the material.

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OPPORTUNITY TO IMPROVE THE EFFICIENCY OF AFTERSIEVE PNEUMATIC SEPARATION.

Аннотация: В статье описано направление решения такой проблемы сельского хозяйства, как подготовка качественных семян зерновых культур. Данное направление заключается в повышении эффективности аспирационных систем зерноочистительных машин.

Ключевые слова: Зерноочистка, аспирация, пневмосепарация, зерно, зерновой ворох, аспирационный канал.

At present the increase of crops yield is one of the main tasks of agriculture. One of the ways to solve this problem is the use of high quality seed at sowing.

Separation of full standard seed, from grain heap, is one of the most important and time-consuming stage in the process of grain receiving, processing and storage. The quality of postharvest grain processing significantly affects the productivity and stability of grain quality during the storage. At present for allocation of total seed grain mixture pneumatic desks and pneumatic separators, are mainly used in the farms of the country.

Pneumatic separators with different air flow direction (vertical, inclined and horizontal) and type (discharge and suction) found their practical application. Modern machines for grain mixture separation do not satisfy the growing demands of the industry [1, 2].

At different times the study of pneumatic separation in agricultural machinery involved many research institutes, individual scientists and inventors. Among them, A.I. Nelubov, V.P. Goryachkin, E.F. Vetrov P.M. Vasilenko, V.M. Drincha, S.S. Yampilov, V.I. Aniskin, K.M. Barkov, N.I. Kosilov, N.G. Gladkov, V.I. Isupov, A.A. Kuroch-

kin, I.P. Bezruchkin, N.I. Struzhkin, A.P. Tarasenko, V.E. Saitov, Y.I. Ermoliev and many others. In recent years the research aimed at improving the efficiency of air flow use in the separation of grain heap are carried out in this country and abroad [6].

The principle of the heap separation in the air flow is laid down in the design of the air system based on the difference of the aerodynamic properties of individual mixture components.

The efficiency of the aspiration channel depends on: the aerodynamic properties of the grain heap components, airflow characteristics; channel shapes and designs; method and supply quantity of the heap.

The efficiency of the aerodynamic properties is valued by the critical air velocity or coefficient of windage. Windage refers to the ability of the body to resist the air when driving in it. Windage is the most complicated physical property of the fractions heap used for separation. It depends on the size, weight indicators, surface properties and the shape of the body, characteristics of the air flow. Each fraction heap is usually characterized by the values of minimum and maximum air speed.

In pneumatic separating units air flow acting on a grain material can be either absorbable or blown. As the design and operation features suction flow usage is advantageous [5].

One of the major drawbacks of the delivery air flow is dust which is very difficult to detect and remove. Staffs have to work in uncomfortable conditions. Dust collecting chamber injection machines are cumbersome, often clogged, dust percolates through the filter into the environment.

Following are the advantages of suction flow cleaning machines compared to the others:

- Pulsing air flow decreases in the separation area.
- Exposure time on the heap increases and as a result the quality of the grain improves.
- Sediment chamber plays the role of an accumulator and improves air flow uniformity in its separation area.
- Emissions of dusty air in the atmosphere reduce.

Depending on the interaction between the air flow and material separation four basic schemes are presented in horizontal, inclined, vertical air flow and by the counter flow principle as well.

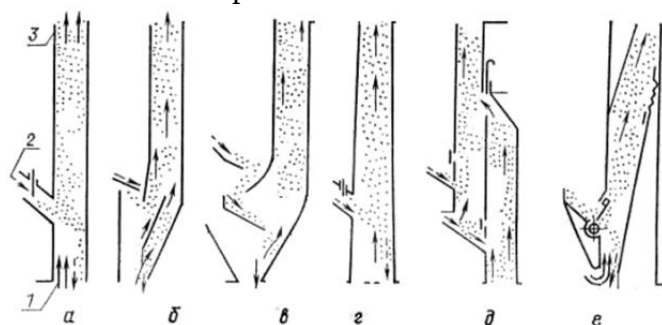
The researches [5] of different of grain cleaner air systems showed that the use of vertical suction air flow is the most efficient one.

Pneumatic circuits of vertical separating channels [4, 5, 7] are shown in Fig. 1.

Demsky A.B. [6] wrote, that rectangular channels of constant section are more efficient (Fig.1), conic, narrowed up (Fig. 1.) in comparison with other forms of channels section (Fig. 1.).

The pneumatic separating canals of this group have restriction by the way transferring the lots per area unit. The influence of air stream intensity is limited by the particles gravity of the main crop. Further increase of grain cleaner crop using traditional schemes is not rational as they demand significant increase in the sizes of the pneumatic separating canals. This, in its turn, leads to unjustified increase in overall dimensions, increase of power consumption and designs, metal consumption decline in quality of operation because of impossibility of providing a uniform field of speeds the channel along section [4, 5,7].

Figure 1. Scheme of the vertical aspiration channels:



a - rectangular channel of constant cross section; b, c - inclined planes with a double purge and rotary valve; g - conic, narrowed up; d – the double; e - wedge-shaped, extending up; 1 - air; 2 - grain heap; 3 - air with light impurities.

An essential lack of the pneumatic separating devices is that their efficiency decreases with the increase in the intensity and a contamination of lots [4,5].

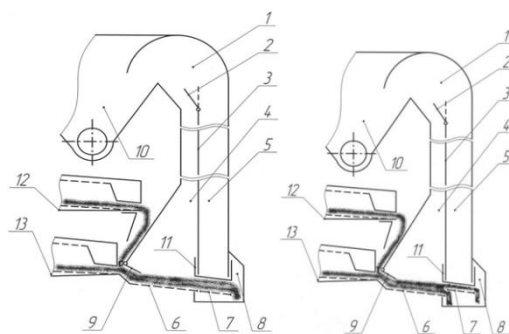
The increase in productivity without decrease in overall performance of aspiration channels is possible at fractional technology of postharvest grain processing.

At fractionation of the dried-up seed material more rational is the allocation of the lots part, not demanding additional processing, at the beginning of technological process. The remained part of grain lots passes all cycle of cleaning which also includes pneumatic separation. Due to the division of grain material into two fractions, grain supply to the canal of after sieve aspiration decreases.

Fractional technology provides better seeds in comparison with their processing on usual line technology.

Investigation were recently carried out in this country and abroad aimed at improving the efficiency of air flow use in the separation of the grain heap. On the basis of these studies device for after sieve grain heaps separation has been patented (Fig. 2) [3].

Figure. 2. Process scheme of the device for sieves after pneumatic separation grain heap:



1,4,5 - pneumatic separation channel; 2 - air valve; 3 - partition wall pneumatic separation channel; 6,7 - sub-channel grid; 8 - discharge channel; 9 - the sectional valve; 10 - sedimentary camera; 11 - slide pneumatic separation channel; 12,13 - sieve.

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INFLUENCE OF PLOW BODY WORKING WIDTH ON WEEDS SUPPRESSION.

Аннотация: по требованиям агротехники к качеству вспашки, заделка растительных остатков, а главное, и осыпавшихся семян сорняков, должна быть глубже 10-12 сантиметров. Такая глубина считается недоступной для прорастания, проростки погибают на полпути до дневной поверхности, а плуг приобретает почётное звание у земледельцев санитара полей. Это особенно важно в качестве противовеса применению гербицидов и резко отличает плуг от всех других почвообрабатывающих орудий.

Ключевые слова: агротехнические требования, качество вспашки, растительные остатки

The kinematics of the layers overturning is that they interfere with each other and lie on the bottom of the furrow with incomplete overturning angle coup. Up to 180° angle δ remains, which depends of the size of the treated sides of the reservoir [1]:

$$\delta = \arcsin \frac{a}{b}$$

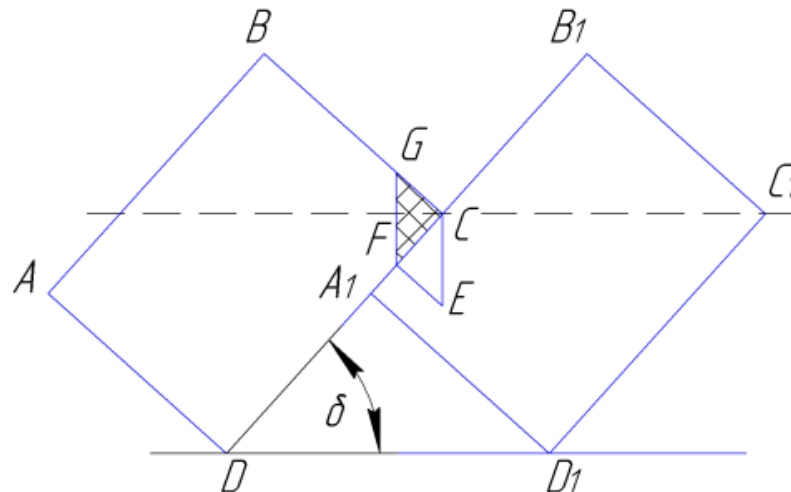
a, b - respectively plowing depth and width of the reservoir.

If the plowing depth is set as $a = 26$ cm, and the width of the reservoir is $b = 35$ cm, the angle of the inverted seams is $\delta = 48^\circ$ (Figure 1). If the weed seeds are located along the line CD, only those of them located at a depth of less than $h_{\min} = 10$ cm from the sun can germinate that is, within the segment CF. Triangle FGC should be $CF = FG \cdot \sin \delta$. The ratio of the segments CF-CD is part of the field with a favorable area for the germination of weeds:

$$\mu = \frac{h_{\min} \cdot \sin \delta}{b}$$

μ - part of the field with the lack of depth of seeding weeds;
 $h_{\min}$ - minimum required depth of weeds seed placement for their suppression;
 δ - Angle of inclination to the horizontal layers;
 b - Width of the plow working body.

Figure 1 - A favorable area for the germination of weeds

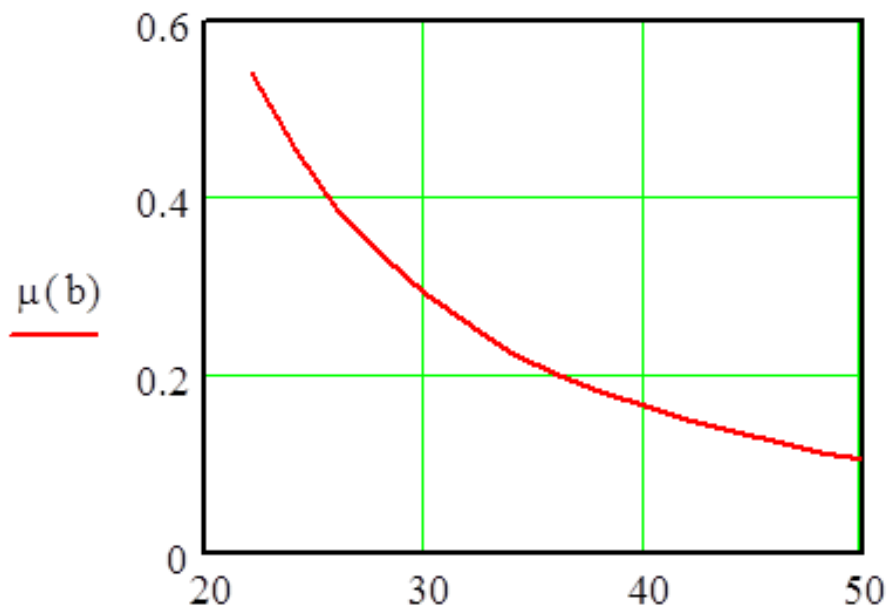


Bearing in mind the angle dependence of the width of the reservoir at a predetermined working depth, transform the equation.

$$\mu = \frac{h_{\min} \cdot a}{b^2}$$

Graphically, this relationship for the depth of processing $a = 26$ cm is shown in Figure 2. When the width of the working body $b = 35$ cm can be expected that after plowing weeds germinate for 21% of the field, while the width of the body $b = 45$ cm 12% area would be obstructed. The graph shows that a further increase in width of the working body reduces its inhibitory ability against weeds, and the width increase the more than 45 cm is impractical, especially that in dry periods very large boulders, torn up when plowing are observed. There are other ways to increase the depth of weeds seed placement, for example, cleaning the open furrow with additional disks [2], [3] or vertical flaps [4] with a slight increase in traction [5].

Figure 2 - The effect of the width of the seam on the germination of weeds after plowing



The width of the working body, equal to 45 cm is well-suited to deep plowing under sugar beets. It is adopted for beet plows produced at Voronezh "FAZ-Holding" and allows turning the layers without the risk of instability on the plowing depth of 34 cm. In addition when the plow body working width increases the width of technological passages the plow bodies also increases [6]. This allows plowing even sunflower stalks without clogging under the plow frame.

Thus a plow rational width of 45 cm improves the soil layer overturning with more reliable weeds suppression. Its technological reliability on weedy plots also increases.

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***Секция III. Научно-исследовательский потенциал
современной молодежи в аграрной экономической науке
и управлении АПК***

***Section III. Research potentialities of young
specialists in agricultural economy and management***

УДК 519.7

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FINDING THE OPTIMAL STATE OF THE ENTERPRISE

Аннотация. В работе рассматривается подход к решению задачи линейной многокритериальной оптимизации, учитывающий тип взаимодействия между соответствующими целевыми функциями. Данный подход используется для определения потенциала предприятия и о принятии решения о возможности стремления предприятия к этому идеальному состоянию.

Ключевые слова. Принятие решений, критерий, многокритериальная оптимизация, целевая функция, ранжирование, кооперация, конфликт, независимость, правило простого большинства, правило Кондорсе, обобщенная функция.

The *decision-making* is a purposeful process, including the definition of objectives, formulation of the problem and the procedure of decision-making (a choice of one of the available alternatives, better in some ways). The *goal* in a broad sense is understood as an ideal representation of the desired condition or results of operations [1].

Alternative solutions are one of the possible ways to achieve these goals.

Solution to the decision-making problem is to choose one or more options from a set. In order to make such a choice, it is necessary to clearly define the purpose and criteria (quality indicators), which will assess a set of alternatives.

The implementation of each alternative leads to the occurrence of some consequences (outcomes), analysis and assessment which is

carried out on one or more criteria form a set of criteria. As a rule, the criteria refers to an indicator for which tasks under this decision is necessary to define an extreme solution.

Selection of the optimal solutions is usually based on a set of criteria characterizing the effectiveness, usefulness, as admissible solutions.

In modeling the decision-making processes the most significant factors that must necessarily be considered in the model are multicriteria and uncertainty and, in some studies indicate that multicriteria is a consequence of the uncertainty [1].

The presence of many of the goals that characterize the optimal solutions from different perspectives is also a manifestation of uncertainty. This leads to the fact that instead of scalar criterion a vector is considered. Development of approaches to solving multiobjective optimization problems is an urgent problem of modeling complex systems and processes.

An approach to the evaluation of the interaction of objective functions is developed in this paper. The developed approach can be used to solve the problem of determining the company potential and a decision on the possibility of the enterprise aspiration to achieve this ideal state.

It should be noted that the objectives of the problems with several objective functions can be in various relations with each other. The main types of interaction between the objective functions in linear programming problem, which are identified in the article, are cooperation, conflict and independence.

In case of cooperation the achievement of one purpose promotes the achievement of another. It is obvious that in this case the effect from the achievement of both the purposes exceeds effects from each purpose taken separately. In case of conflict the achievement of one of the purposes promotes the fact that other objective can't be achieved.

Algorithm for solving linear optimization problems, considering type of interaction between the objective functions is used in this article [2, 4].

As the principles of group decision making the rule of the simple majority and Condorcet's rule are used [3].

We consider the problem of multi-purpose optimization and it is a decision based on the definition of the interaction coefficients of the objective functions.

The multi-criteria optimization problem. We will consider a problem of multi-criteria optimization

$$\begin{cases} f_1(x) \rightarrow \max, \\ \dots \\ f_n(x) \rightarrow \max, \\ x \in X, \end{cases} \quad (1)$$

where $x = (x_1, \dots, x_n) \in R^n, X \in R^n$ – the set of feasible solutions of the problem (1), $\forall i = \overline{1, N}$ ($f_i: R^n \rightarrow R$) – objective functions.

As a rule, in multi-criteria optimization problems all the criteria are assumed independent. However, in most real-world situations objective functions almost are inconsistent and conflicting inevitably. The ignorance of this factor leads to a considerable simplification of the problem.

In works [2, 4] the approach to solve linear multiobjective optimization problem, considering type of interaction between the objective functions and based on the use of the additive convolution, which allows for each subset of objective functions with a certain type of interaction to form a generalized function is offered:

1) for each objective function $f_j(x)$ the problem of one-criteria optimization with an initial set of restrictions is solved

$$\begin{cases} f_j \rightarrow \max \\ x \in X. \end{cases} \quad (2)$$

Thus we receive the optimum solution x_j^* and the corresponding value of the objective function $f_j(x_j^*)$;

2) for each pair of objective functions $f_i(x)$ and $f_j(x)$ the interaction coefficient k_{ij} is determined by the formula

$$k_{ij} = \frac{\sum_{k=1}^n c_{ik} c_{jk}}{\sqrt{\sum_{l=1}^n c_{il}^2} \sqrt{\sum_{l=1}^n c_{jl}^2}}. \quad (3)$$

A matrix of the interaction coefficients of the objective functions $K = \{k_{ij}\}_{n \times n}$ is formed;

3) the type of interaction between all pairs of objective functions using the rules is defined:

1. if $k_{ij} \in \left[\frac{1}{2}, 1\right]$, then goals $f_i(x)$ и $f_j(x)$ cooperate;
2. if $k_{ij} \in \left[-1, -\frac{1}{2}\right]$, then goals $f_i(x)$ и $f_j(x)$ conflict;
3. if $k_{ij} \in \left(-\frac{1}{2}, \frac{1}{2}\right)$, then goals $f_i(x)$ и $f_j(x)$ independent;
4. the set of cooperating $S_{\text{кооп}}^j$, conflicting $S_{\text{конф}}^j$ and independent $S_{\text{нез}}^j$ functions for each function $f_j(x)$, $j = \overline{1, n}$ are defined;
5. for each objective function $f_j(x)$ importance of appropriate interaction α_i^j ($i = \overline{1, 3}, j = \overline{1, n}$) are determined by the formula $\alpha_i^j = \frac{s_i^j}{n}$ so that $\forall j \left(\alpha_{\text{кооп}}^j + \alpha_{\text{конф}}^j + \alpha_{\text{нез}}^j = 1 \right)$;
6. principle for the selected group decision making is based ranking $(x_{j_1}^*, \dots, x_{j_n}^*)$ decisions on preference depending on values of the objective function. Appropriately objective functions are arranged;
7. using a special procedure, on the basis of distances between sets of one-criteria problems, dependency ratios for each pair of objective functions are defined. The generalized function is built;
8. the problem with the generalized objective function and the initial set of restrictions is solved

$$\begin{cases} F(f_1(x), \dots, f_n(x)) \rightarrow \max \\ x \in X, \end{cases} \quad (4)$$

where

$$F(f_1(x), \dots, f_n(x)) = \frac{1}{n} \left(\sum_{i=1}^n s_1^i F_i^{\text{кооп}}(f_1(x), \dots, f_n(x)) + \right.$$

$$\sum_{i=1}^n s_2^j F_j^{\text{KOH}\Phi}(f_1(x), \dots, f_n(x)) + \sum_{i=1}^n s_3^j F_j^{\text{He3}}(f_1(x), \dots, f_n(x)).$$

Applications. Very often the enterprises are faced by the task in detection of a perfect condition and do the best to achieve the goal. For this purpose it is necessary to estimate a current status of the enterprise, to reveal its possible potential and to define, how currently the enterprise is far from its potential perfect condition. In this paper we propose an approach to solve the problem.

We will consider the following problem. As a productive indicator, indicator of the enterprise efficiency is selected. As a sign of factors $x_1, \dots, x_5$, influencing a productive sign, the main possible indicators are identified: x_1 – the production volume, mln. rub; x_2 – the number of enterprises staff, hundreds; x_3 – investments into the development programs, mln. rub.; x_4 – an average salary, ths. rub.;

x_5 – the number of structural departments.

As a result of the analysis the model is composed (5-6)

$$\begin{aligned} y_1 &= f_1 = 4x_1 + 2x_2; \\ y_2 &= f_2 = 2x_1 + 4x_2; \\ y_3 &= f_3 = 4x_1 - x_2; \\ y_4 &= f_4 = -3x_1 + x_2; \end{aligned} \tag{5}$$

$$\begin{aligned} 2x_1 + 3x_2 &\leq 18; \\ -x_1 + 3x_2 &\leq 9; \\ 2x_1 - x_2 &\leq 10; \\ x_1 &\geq 0; \quad x_2 \geq 0. \end{aligned} \tag{6}$$

These data reflect a current status of the enterprise. Apparently from model, only two criteria are significant. Using the method described above for solving multiobjective problem [2, 4], we will receive that the best decision of this problem is the point (6, 2). Therefore, the potential to which the enterprise will aim is a follows:

$$x_1 = 6, x_2 = 2.$$

This means that the company needs to aim to the production volume in the amount of 6 million rubles and the number of staff of the enterprise – 200 people.

As in daily life of an individual and organization activities or society in general, decision-making is the major component which defines the future.

In many areas of human activity it is necessary to define the problem decision which is not optimal by one criterion, but by several ones simultaneously.

In this paper the approach to solve the problem of linear multi-criteria optimization, considering type of interaction between the objective functions is considered. This approach is used to determine the potential of the company and making decision on the possibility of the enterprise aspiration to achieve this ideal state.

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THE NATURE AND CONTENT OF THE AUDIT OF NONCURRENT ASSETS IN A MARKET ECONOMY

Аннотация: Аудит в необоротных активах бесспорно представляет собой особую важность. В условиях рыночной экономики недостоверная информация о состоянии организации и ее деятельности оказывает негативное влияние на процесс принятия решений. В статье рассматриваются теоретические основы классификации активов, цели и способы их аудита.

Ключевые слова: аудит, инвестиции, активы, внеоборотные, нематериальные активы.

Non-current assets are a tool enabling the commercial organization to carry out its production and business activities by committing multiple turnovers of current assets.

The purpose of the audit operations with non-current assets is forming an opinion on the financial statements in terms of performance and of noncurrent assets and accordance of the accounting of the transactions with the requirements of the legislation of the Russian Federation.

The audit of non-current assets includes examining:

- fixed assets;
- profitable investments in tangible assets;
- intangible assets;
- investments in construction in progress;
- financial investments. [1]

Objectives of the audit operations with non-current assets are divided into basic and advanced.

The main objectives of the audit of non-current assets involve the following control actions over:

- availability and safety of fixed assets and intangible assets;
- correct evaluation of fixed assets and intangible assets;

- conformity of documenting and recording of transactions on the movement of fixed assets, intangible assets and other profitable investments in intangible assets to the current legislation;
- The correctness of calculating depreciation of fixed assets and intangible assets and reflecting the operations in the account;
- Organization of the legality of synthetic and analytical accounting operations with fixed assets and intangible assets;
- Confirmation of the reliability of the indicators in the financial statements.

As additional audit objectives of auditing non-current assets there can be distinguished the following:

- audit of the revaluation of fixed assets and the reflection of its results in the accounting and reporting;
- inspection of operations on repairing fixed assets, including confirmation of the correctness of documenting operations associated with the repair of fixed assets;
- testing transactions associated with renting the property, including the correctness of recognition of income and expenses from rental operations;
- analysis of the effectiveness of fixed assets.

Verification program of non-current assets includes questions of detailed checking individual items of non-current assets using the audit working papers.

Before the implementation of the audit program the auditor should:

- evaluate the internal control system of non-current assets;
- assess the risks and importance of these items;
- define methods of testing and calculate the volume of audit sampling. [3]

Of particular importance is the fact that an independent auditor implements checking validation of reporting organizations, compliance with applicable laws and the auditor's report.

In a market economy the possibility of providing false information about the organization of its activities has a negative impact on the effective economic decision-making. Therefore, an audit is undoubtedly important.

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LA COMPTABILITE ENVIRONNEMENTALE AGRICOLE: ACTUALITE FRANÇAISE

Аннотация: В этой статье рассматривается экологический учет: представлены примеры французских систем сельскохозяйственного учета, которые учитывают вопросы сильной устойчивости.

Ключевые слова: экологический учет, Франция, сельское хозяйство.

Aujourd'hui, l'humanité se préoccupe de plus en plus des problèmes écologiques et sociaux, dont témoigne par exemple, le sommet mondial «Rio+20» [7] qui s'est tenu au Brésil, il y a deux ans, ayant rassemblé des milliers de participants, dont les dirigeants mondiaux, les représentants du secteur privé, des ONG et d'autres groupes «pour déterminer comment réduire la pauvreté, promouvoir la justice sociale et assurer la protection de l'environnement sur une planète qui est de plus en plus peuplée»¹.

A cet égard, la comptabilité environnementale devrait permettre à l'administration de l'entreprise aussi qu'au grand public d'obtenir

¹ Rio+20, Site Internet. Disponible sur <http://www.un.org/fr/sustainablefuture/about.shtml> (consulté le 23 septembre 2012).

l'information nécessaire pour la gestion de l'environnement et la prise des décisions d'investissement.

Cette information est devenue partiellement obligatoire dans certains pays dont la France (avec la loi sur les Nouvelles Régulations Économiques et la loi Grenelle 2) [2]. L'article 225 de la loi Grenelle 2 prévoit des indicateurs d'impact de l'entreprise sur l'environnement et de ses relations avec les parties prenantes par les sociétés cotées et non cotées (au-delà d'un certain seuil pour les dernières)².

Cependant, comme l'a remarqué Gray en 2010 [4, p. 48], «la plupart des rapports et des activités des entreprises au nom du développement durable n'ont en général que peu de choses à voir avec le développement durable... Quelle que soit la nature de la comptabilité environnementale des organisations, ce n'est en aucun cas une comptabilité environnementale»³.

Cette affirmation critique se situe notamment dans la perspective de la durabilité forte, c'est-à-dire d'un développement qui respecte les seuils physiques environnementaux caractérisant le niveau minimum du capital naturel qui doit être conservé.

Mais qu'en est-il de la comptabilité agricole? Son objet est étroitement lié à la nature et aux processus biologiques, et ne peut pas négliger les normes scientifiques d'utilisation et de conservation du capital naturel. L'impact environnemental de l'agriculture est plutôt plus important que celui des entreprises industrielles [3]. L'agriculture est confrontée à des enjeux environnementaux majeurs tels que la perte de biodiversité, l'utilisation des ressources naturelles allant parfois jusqu'à leur épuisement, la pollution, notamment la contamination des sols et des eaux par les pesticides et les nitrates.

Pour prendre en compte tous ces enjeux un nouveau modèle du développement est discuté, celui du développement durable. Il est à noter le renforcement récent de la prise en compte des aspects écologiques avec une tendance prononcée au respect des principes de

² Les sociétés non cotées dont le total du bilan ou le montant net du chiffre d'affaires dépasse 100 M€ et dont le nombre moyen de salariés permanents employés est supérieur à 500, aux exercices ouverts après le 31 décembre 2013.

³ Notre traduction de *"most business reporting on sustainability and much business representative activity around sustainability actually have little, if anything to do with sustainability... So whatever else organisational 'accounts of sustainability' are, they are probably not accounts of sustainability"* (Gray, 2010, p. 48).

durabilité forte au niveau d'Etat français depuis 2012 (cf. par exemple, Le Foll [5]).

C'est pourquoi la comptabilité environnementale est précisément l'objet de cet article: nous nous intéressons à la recherche d'exemples de comptabilités agricoles qui prendraient en compte les enjeux de durabilité forte. De cette manière, nous espérons répondre à cette thèse de Gray [4, p. 48] en apportant une réponse plus optimiste.

La comptabilité environnementale

En général, la comptabilité environnementale est censée mesurer des impacts écologiques des organisations, voire des nations, et leur efficacité écologique, économique et sociale. De plus, on distingue de nouvelles formes du capital (en plus du capital financier, ou du capital produit (man-made capital)), - capital naturel, capital humain, capital social, parfois capital intellectuel et celui artistique [6]).

Cependant, il n'existe pas encore de méthodologie, ni de norme universelle en ce qui concerne la comptabilisation des impacts écologiques et sociaux de l'entreprise.

On assiste également à l'assimilation de la comptabilité avec les indicateurs. Ainsi, la comptabilité verte se rapproche d'autres processus de gestion tels que l'élaboration et l'utilisation des indicateurs, l'analyse systémique, etc...

La comptabilité environnementale dans le secteur agricole

On peut observer une multiplicité d'approches comptables proposées dans le contexte de l'agriculture durable. L'accent est souvent mis sur la construction des systèmes d'indicateurs.

Parmi les 30 méthodes de la comptabilité environnementale agricole identifiées⁴, la méthode IDEA (indicateurs de durabilité des exploitations agricoles) [8] s'est avérée l'une des méthodes les plus élaborées [1]: elle reflète l'optique de durabilité forte car les performances globales de chaque échelle de durabilité (agroécologique, socio-territoriale, économique) sont indépendantes et ne peuvent pas s'additionner; elle traite des trois aspects du développement durable; et divers enjeux environnementaux sont pris en compte à l'échelle locale au niveau microéconomique, qui peut être élargi au niveau macroéconomique.

⁴ Cf. Altukhova [2013] pour une présentation plus exhaustive de l'ensemble de ces méthodes de comptabilité verte agricole.

Cette méthode a été élaborée par un groupe de travail pluridisciplinaire sous la tutelle du ministère chargé de l'agriculture et de la pêche de la République Française; elle aide à apprécier les forces et les faiblesses du système de production, et à identifier des voies d'amélioration vers plus de durabilité [8]. Basée sur l'auto-diagnostic et l'enquête directe, la méthode IDEA est relativement simple et facile à mettre en œuvre. C'est avant tout un outil de réflexion et d'apprentissage.

La méthode IDEA prévoit des normes pour chacun des aspects traités et refuse l'idée d'une substitution du capital financier aux capitaux naturel et humain. Divers enjeux environnementaux sont pris en compte à l'échelle locale au niveau microéconomique qui peut être élargi à celui macroéconomique. En ce qui concerne la note finale de durabilité de l'exploitation, les auteurs considèrent que les performances globales de chaque échelle de durabilité sont indépendantes et ne peuvent pas s'additionner, ce qui témoigne de l'optique de la durabilité forte.

De surcroît, la méthode IDEA est l'une des plus utilisées à l'heure actuelle dans le secteur agricole. C'est pourquoi nous nous attardons sur la présentation de cette méthode et les résultats de sa mise en œuvre, notamment à travers l'exemple d'une exploitation agricole de la région Île-de-France.

La méthode IDEA: exemple d'une comptabilité environnementale

Depuis 2000, plus de 1500 exploitations agricoles ont testé la méthode IDEA. En France, ont appliqué la méthode IDEA, entre autres, l'exploitation de Saint-Maurice Lycée agricole de Vendôme à Loir-et-Cher (en 2005), EPL Toulouse-Auzeville à Haute Garonne (en 2009), EPL Château-Gontier à Mayenne (en 2009), EPL de l'Eure Chambray à l'Eure (en 2009).

La méthode IDEA est basée sur l'approche systémique utilisée dans les sciences agronomiques depuis de nombreuses années en France.

Elle se présente comme un système d'indicateurs chiffrés qui sont généralisés en dix composantes, et ensuite répartis en trois échelles de durabilité, à savoir: agroécologique, socio-territoriale et économique. A chaque indicateur sont associés les barèmes de

notation et les pondérations qui leur sont affectées. Les trois échelles de durabilité varient entre 0 à 100 points. Des notes maximales sont définies pour chaque indicateur afin de plafonner le nombre total d'unités de durabilité. Plus la note est élevée, plus l'exploitation est durable.

Le choix de l'exploitation de la Bergerie Nationale de Rambouillet est dicté par le fait que le diagnostic IDEA est réalisé chaque année sur l'exploitation de la Bergerie Nationale de Rambouillet depuis 2003. A l'heure actuelle, c'est la seule exploitation française à appliquer la méthode IDEA systématiquement et ce dès l'élaboration de cet outil.

L'étude des données comptables et des résultats des diagnostics IDEA a révélé [1] que la méthode IDEA est extrêmement utile et permet de prendre en compte les enjeux sociaux et écologiques dans la gestion quotidienne dans une optique forte de durabilité car elle prévoit des normes pour chacun de ces aspects et refuse l'idée d'une substitution du capital financier aux capitaux naturel et humain.

La comptabilité de la Bergerie Nationale de Rambouillet ne se limite pas à connaître les impacts de l'extérieur sur l'organisation tels que les réglementations et les normes officielles en vigueur. En effet, il s'agit fondamentalement d'une vision «intérieur-extérieur» [6] qui cherche à connaître sinon tous les impacts de l'organisation sur l'environnement, du moins le maximum d'entre eux. Dans l'idéal, ce type de comptabilité devrait prévoir toutes les dépenses optimales pour satisfaire aux normes agroécologiques et sociales.

Dans son état actuel, la comptabilité de l'exploitation étudiée reflète certaines mesures basées sur les préconisations de la méthode IDEA, mais dans le même temps, la direction de l'exploitation est consciente du fait qu'il reste encore des progrès à faire vers plus de durabilité. L'agroécosystème étant complexe, les changements relatifs à certains critères peuvent prendre parfois des années. De plus, du fait de la situation économique qui a été mauvaise au début des années 2000 et qui s'est un peu améliorée depuis, il manque des ressources pour mettre en œuvre toutes les mesures environnementales. C'est pourquoi cela se fait au fur et à mesure, à travers les projets d'exploitation (Projet d'exploitation 2010-2013), où le directeur de l'exploitation présente les objectifs stratégiques et opérationnels du

projet à l'échelle de l'exploitation et au niveau de chaque atelier. On peut considérer ce projet comme un exemple d'une comptabilité environnementale prévisionnelle.

Ainsi, dans le cas de l'exploitation de la Bergerie Nationale de Rambouillet, il s'agit de la gestion se basant, entre autres, sur la méthode IDEA, et du mode de gouvernance (dont prise de décisions en concertation avec les salariés, ainsi que la présentation et discussion des résultats avec les parties intéressées deux fois par an) qui intègrent les enjeux de durabilité forte.

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**ASSESSMENT OF COMPETITIVENESS OF THE
ENTERPRISE ON THE EXAMPLR OF JSC RODINA OF
THE VORONEZH REGION**

Аннотация: В статье приводятся различные методики оценки конкурентоспособности предприятия. На примере ЗАО «Родина» Россошанского района Воронежской области рассмотрена оценка, базирующаяся на составлении конкурентной карты.

Ключевые слова: конкурентоспособность, анализ конкурентных преимуществ

Successful functioning of the enterprise in the conditions of market economy in many respects is defined by the level of its competitiveness. Competitiveness is understood as ability of the enterprise to make such production which according to various characteristics will be the most attractive to consumers in comparison with similar goods of competitors.

For the most effective business the enterprise needs to pursue policy on improvement of the position in the market for the purpose of the competitors. In the organization the control system of quality of production as one of the main indicators of competitive advantage has to be well debugged; monitoring of the buyers needs, the analysis of a financial state has to be carried out.

In general, competitiveness is defined by set of external and internal factors. The following are the external factors:

- Financial and credit, tax and investment of the state policy
- Size of solvent demand
- Standardization and certification of production
- Level of market conditions knowledge
- Climatic conditions

The following are the internal factors:

- Competitiveness of production
- Financial condition of the enterprise
- Marketing activity
- Organization and production management
- Innovative activity
- Size of the enterprise [4].

Each enterprise is interested not only in improvement of the competitive advantages and a gain of leadership in the market, but also in an assessment of their current state. For this purpose there are various competitiveness calculation methods of the enterprise:

1. SWOT analysis.

2. The technique of an assessment of competitiveness of the organization on the basis of "4P" based on the comparative analysis of the organization and the enterprises - competitors on factors: a product, the price, and advance in the market and sales channels.

3. Technique of an assessment of competitiveness of Zh.Zh firm. Lamben on the basis of such criteria as a share of the market, distinctive properties of goods, expenses, extent of technology development, channels of merchandising and image.

4. The assessment based on research of the internal enterprise environment [2].

Besides the above-mentioned techniques considering influence of a set of factors there is an assessment of competitiveness of the enterprise on the basis of two indicators – shares of the market and dynamics of a share of the market for a certain period of time. The essence of this method consists in drawing up the competitive card of the enterprise taking into account its status.

By this technique distribution of a market share allows to allocate four standard provisions of the organizations in the market:

- Market leaders;
- Strong competitive position organizations;
- Weak competitive position organizations;
- Outsiders of the market.

Taking into account the dynamics of a market share during time also allocate 4 provisions of the organization for this criterion:

- Quickly improving competitive position;
- Improving competitive position organizations;

- Worsening competitive position organizations;
- Quickly worsening competitive position organizations .

For drawing up the competitive card it is necessary to construct a matrix concerning a market share and its dynamics. On crossing of these indicators one of 16 possible statuses of the enterprise is established. They characterize the possibility of opposition to competitors, and also the level of using the advantages. Thus the most preferable indicator is market share dynamics.

We will carry out an assessment of competitiveness of JSC Rodina of the Rossoshansky region of the Voronezh region, having made the competitive card during 2009 - 2011. The enterprise has a crop focus (it is focused on production of grain crops). The branch of animal husbandry is also presented. The enterprise refers to one of the two organizations of the area having a pig-breeding complex.

We will note that the main competitors on the occupied market shares are JSC Vostok-Agro, JSC Agrobusiness and SHA "Freedom" which produce similar production.

Shares of the market of the main competitors in reporting year are 23%, 14% and 8% respectively. The market share of JSC Rodina in 2011 was 15%. And rates of a gain of market shares in relation to basic year were respectively equal 1, 5, 1 and 1 percentage points. On the basis of the calculated data we will make the competitive card (tab. 1).

Table 1. Competitive card of JSC Rodina

Accession rate (T), items.	Share of the market, %			
	Market leaders (share > 40%)	The organizations with a strong competitive position (from 15% to 40%)	Weak competitive position organizations (at a share from 5% to 15%)	Outsiders (at a share less than 5%)
1	2	3	4	5
Quickly improving competitive position organizations (T > 10 items)	1	5	9	13
Improving competitive position organizations (T from 5 items to 10 items)	2	6	10 JSC Agrobusiness	14

Table 1. Continuation

1	2	3	4	5
Worsening competitive position organizations (T from-5 items to 5 items)	3	JSC Rodina, JSC Vostok-Agro	SHA "Freedom"	15
Quickly worsening competitive position organizations (T <-5 items) 4 8 12 16	4	8	12	16

According to the card, the enterprises have the following statuses: JSC Rodina and JSC Vostok-Agro the status No. 7, JSC Agrobusiness - the status No. 10 and SHA "Freedom" - the status No. 11. Therefore, it is possible to come to conclusion that, the studied organization, and one of the main competitors take an identical and stronger position in the market in comparison with other competitors. Besides JSC Rodina along with JSC Agrobusiness are participants of the priority national project "Development of Agrarian and Industrial Complex". But it is necessary to pay attention that JSC Agrobusiness refers to the improving competitive position enterprises and it can create a threat for the studied enterprise further.

Despite on advantageous position of enterprise, it isn't the leader of the market yet. It also should be noted that JSC Rodina competitive position for the studied period has got worsened (accession rate – 1). It is possible to strengthen the positions in the market, having eliminated the most essential limiting factors – to reduce the prime cost of the made production, to buy more modern harvest equipment, and to use the most progressive technologies.

These actions will allow not only to improve made production quality (and this is one of the key factors of competitiveness as it was told above), but also to increase crop productivity, having increased production scales thereby.

Thus, having used techniques of an assessment of the competitive position in the market, the enterprise can make a decision concerning the production expansion, in case of its advantageous position in the market, reveal the weakest ones and take measures for their further elimination.

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THEORETICAL ENTITY OF THE "DIRECT COSTING" SYSTEM

Аннотация: В настоящее время существенно выросла проблема управления, анализа и контроля затрат на предприятиях. Достижения эффективного развития возможно при наличии низкой себестоимости продукции. В статье рассматриваются теоретические аспекты классификации затрат и современные методы управления затратами предприятия.

Ключевые слова: «директ костинг», административные расходы, классификация затрат, управленческий учет.

Difficult market situation complicates the situation for producers. They are faced with the problem of the production volume and sales as well as increasing the share of fixed costs in their total volume the solution of which significantly affects the oscillation of cost products and, hence, their profits.

These tendencies being increased, producers' demand for the information on the costs of production and sales of products also increases.

The information on partial production costs can be found with the help of the "direct costing" system.

The works of domestic and foreign scholars such as Sh. Anderson, R.A. Alborova, V.A. Artyushenko, A.A. Askarov, E. Raven, A.A. Efremov, K. Drury, E.I. Kostyukova, I.E. Goushchin, Ch.T. Horngren, Ch. Harrison, R. Anthony and others are devoted to the problem of formation and development of cost accounting system according to the direct costing system.

Having studied the works of some authors, one can distinguish the authors' opinion that in our view reveals the essence of the "direct costing" system.

According to M.A. Vakhrushina, "direct costing" is a system which takes into account the cost of production and sales, based on the division of total costs into constant costs, i.e., they do not depend on the number of products produced and (or) sold for a given time period and variable indirect costs, i.e., only variable costs are allocated to cost objects. The remnants of finished goods in the inventory at the beginning and the end of the year and incomplete production as well as estimates of reserves, semi-finished and finished products are estimated according to the variable costs [3, p. 194].

In her works N.V. Malinovskaya writes that the essence of the "direct -costing" is to divide the costs into fixed and variable. During the development phase of variants of administrative decisions and selection of the most appropriate of them it is very important to divide costs, depending on their behavior with changes in the level of business activity (outputs) into fixed, variable and mixed ones[6, p. 38-40].

The "direct costing system", according to I.E. Goushchina, involves the assessment of costs which are directly related to the performance and can be verified [4,p. 69-78].

V.V. Mikhaylina (see The "direct costing" system - an effective means of risk management") writes that according to "direct costing" system the accounting costs system is based on the accounting and calculating incomplete, limited cost. The latter includes direct costs

and variables depending on changes in the volume of production [7, p.94-96].

From the viewpoint of N.F. Danilova "direct costing" is a way of gathering the information necessary for management analysis [5, p. 66-68].

Under the "direct costing" system the cost of industrial products is accounted for and, accordingly, planned only in relation to variable costs. In the "direct costing" system the scheme for constructing multi-earnings reports contains a number of key financial indicators: profit margin (profit) or the amount of coverage and profit.

I.A. Avrova writes that the operating "direct costing" system is one of the most widely used systems in production management accounting. It consists of the elements of accounting, control, analysis, forecasting and management decision-making [1, p. 83-86].

In the article "Evaluating the effectiveness of agricultural production by the" direct costing "A.A. Askarov writes that the essence of the "direct- costing" consists of dividing the total costs of the enterprise into permanent costs which do not depend on the number of products produced within a certain period and variable ones changing in proportion to the number of products produced during the same period. The main feature of "direct costing" based on the classification of expenditure into fixed and variable is that the cost of production is taken into account and planned only in relation to the variable costs. Fixed costs are not included in the calculation of the cost of production (manufacturing) but written off from the profit within the period of their production, just as the costs in the given period [2, p. 40-42].

N.F. Mushenko says in his article that the "direct costing" system serves as information basis of marginal approach to management. Promoting marginal approach we make an unquestionable rule: the inevitable fixed costs common to several segments and distributed among them in the traditional way in proportion to any base are not included in the decision-making process [8, p. 35-43].

According to S.A. Pivkin the "direct costing" system because of its limitations is often not applicable and does not solve the most im-

portant economic issues: defining product profitability, planning for the long term, etc. [9, p. 63-67].

Analysis of the degree of researches of the "direct costing" being made shows that in transition economy many aspects are still insufficiently investigated, despite the attention paid by Russian scientists to this problem. Besides, no clear classification of costs influencing the cost of production has been made.

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DIFFERENT DEFINITIONS OF FINANCIAL SAFETY OF ENTERPRISES

Аннотация: Рассмотрены подходы к определению понятий экономической безопасности, финансовой безопасности в экономической литературе; предлагается авторский вариант определения финансовой безопасности; обращается внимание на условие финансовой безопасности предприятия как способность противостоять существующим и возникающим опасностям и угрозам.

Ключевые слова: финансовая безопасность, экономическая безопасность

Modern conditions of managing are characterized by instability and uncertainty in social and economic sphere of the Russian Federation at simultaneous development of the crisis phenomena of a world scale. It leads to growth of economic risks. The result is that prospects of falling-off of production and enterprise transition to critical or pre-bankruptcy state gain real outlines.

Problems of provision of financial safety have actually gained an extreme urgency. It is connected not only with financial crises, instability growth, but also with a constant variation of the prices for energy resources (first of all – oil and gas), a rise in price for banking services.

As an independent object of research, financial safety of the enterprise began being considered rather recently. In spite of the fact that questions of financial safety of the enterprise are considered in the educational literature, materials of periodicals, collections of proceedings, at present there is no standard determination of a category «financial safety of the enterprise», in insufficient degree the factors in-

fluencing financial safety, approaches to an estimation of its level for subjects of managing are studied.

Financial safety is an organic and an integral part of economic safety as a whole. The concept of «economic safety» has appeared in a lexicon of the Russian scientists and the experts working in the field of management of economy, at the turn of XX and XXI centuries. Frequently authors, considering an essence of this concept, give their own determinations, using thus in various combinations categories of the economic sovereignty and independence, reliability and stability, economic interests.

E. A. Olejnikov [2] expresses opinion that «the category of economic safety can be considered from different perspectives and, first of all, as a condition, as a process and as the system having certain structure. Economic safety as a condition is availability of such economic, production and technological possibilities which allow national economy perform steady functioning. Economic safety as a process is a creation and consolidation of the conditions providing steady functioning of national economy in the future. The structural aspect of a problem assumes allocation of the basic facts influencing economic safety of the nation».

T.D. Romashchenko [4] believes that «economic safety is not only a state of the economy in an existential continuum, but also is an economic category expressing economic relations and holding a certain place in economic system».

By the economic safety we imply the qualitative characteristic of economic system determining its capability to keep up normal conditions of working capacity of the system, development within the framework of the purposes put before the system, and in cases of occurrence of various threats (external and internal) the system is able to resist them and to recover its working capacity.

Economic safety is a set of fundamental elements of economically effective country as a whole. Financial safety is the major component of economic safety under the conditions of market economy.

I. A. Blank[1] defines the financial safety of the enterprise as the quantitatively and qualitatively determined level of a financial condition of the enterprise providing stable protection of its foreground balanced financial interests from identified real and potential threats of

external and internal character, which parameters are determined on the basis of its financial philosophy and create necessary preconditions of financial support of its steady growth in the current and perspective period.

A little differently R. S. Papehin [3] treats financial safety, considering that this is limiting state of financial stability wherein there should be enterprises for realization of the strategy. Financial safety is characterized by capability of the enterprise to resist external and internal threats. The essence of financial safety of the enterprise, according to the author, consists in its capability to independently develop and lead financial strategy in compliance with the purposes of general corporate strategy, under conditions of the uncertain and competitive environment.

Having studied approaches to treatment of financial safety, we offered the following its determination: this is a stable protectability of operational and financial activities from real and potential external and internal threats for the purpose of provision of its sustainable development in the current period and for the long term.

The key element of financial safety of the enterprise is the capability to withstand both existing and arising dangers and the threats, aiming to cause a financial damage to the enterprise or close it down forcibly.

Management of financial safety of the company is provided with purposeful influence on the arising threats capable negatively to affect cost and market prospects of business.

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FORECASTING OF STEADY GRAIN PRODUCTION BY METHOD OF THE SINGULAR-SPEKTRUM ANALYSIS

Аннотация: Для прогнозирования урожайности сельскохозяйственных культур предлагается использовать метод сингулярно-спектрального анализа, который позволяет практически одновременно выделять все составляющие компоненты временного ряда, а не проводить эти операции последовательно, как это традиционно рекомендуется. Предложенная методика прогнозирования урожайности имеет большое практическое значение при разработке мероприятий для обеспечения устойчивого развития такой отрасли сельскохозяйственного производства, как растениеводство.

Ключевые слова: устойчивое развитие, прогнозирование урожайности, сингулярно-спектральный анализ.

Introduction. According to the social and economic significance and the results of its activity an agricultural sector is one of the most important components of the national economy. However, it has a number of peculiarities which introduce additional difficulties to the organization of production. First, agricultural production in our country is conducted in the difficult climatic conditions, in a zone of risky agriculture, secondly, this branch has a complicated social structure, and thirdly, the level of productive forces development is lower than

in other branches. From the aforesaid it is expedient to consider the problem of stability in agricultural grain production.

Stability of production is one of the main conditions of the effective development of the branches in the national economy, especially for the agricultural branch as it is a backbone for the whole agrarian and industrial complex. Stability of plant growing, as a rule, is defined on the basis of an assessment of the level of variability in yielding capacity or in gross yielding [8]. The analysis of the sustainable development on the basis of yield variability studying is a difficult task: it is necessary to consider their stability year by year, the dependence on the agro-climatic conditions, periodicity of waves and a lot of other random factors. The solution to the problem substantially depends on the efficiency of scientific methods of forecasting which allow estimating the degree and the direction of the variability in yielding capacity.

Forecasting on the basis of a time series assumes the preliminary analysis of this series: formulation of the main assumptions of its structure, assessment of a random component and so forth. The qualitative analysis usually precedes studying of possible existence of a trend in a studied time series, cyclic components, and a random component. In our work we will use the additive model

$$X_t = Tr_t + S_t + E_t, (t = 1, 2, \dots, n), \quad (1)$$

where Tr is a trend, a smoothly changing component, describing pure influence of long-term factors, i.e. a long tendency of changing of a studied characteristic;

S is a cyclic component, reflecting repeatability of the studied processes during a certain period;

E is a random component, reflecting the influence of random factors which are beyond account and registration.

To speak about a seasonal component as it is usually accepted by consideration of time series [1, 2] within the substantial statement of our problem is not meaningful.

Let's note that the technique of using an additive model without special difficulties can be transferred to a case of a multiplicative model

$$X_t = Tr_t * S_t * E_t, (t = 1, 2, \dots, n), \quad (2)$$

which is reduced by taking the logarithm to the model (1).

Within our approach it is offered to adhere consistently to a traditional technique in the research of the time series structure. However for the solution to this problem the new approaches based on the method of the singular-spectral analysis will be involved.

Preliminary analysis of the basic data

Simulation and forecasting of crops productivity can act as an independent task. As productivity possesses obviously expressed random character and possible repeatability at the same time, we have chosen the method of the singular-spectrum analysis (Singular Spectrum Analysis (SSA)), which had appeared in the last quarter of the XX century as a method of simulation. This method [11], [3] does not provide a parametrical model of a series, but possesses the ability to allocate the amplitude modulated components that distinguishes it from the methods using decomposition of Fourier. The only input parameter of the algorithm is the value of the «window parameter».

The SSA method has rather strict justification in the theory of the dynamic systems and has proved itself in the time series decomposition and also in noise suppression. As for division of the methods of time series analysis into global and local [5] this method belongs to the global one as during the analysis of a time series uses the information of all known values of the series levels.

Using the SSA allows to define practically all the components of a time series simultaneously, instead of performing these operations consistently as it is traditionally recommended. After the defined components removal the rest part of a time series as it will be shown below, will be reduced to the stationary process. So, the analysis of the remains of the series got from the initial time series after an excluding of the specified components is the following step. Thus the following tasks will be consistently solved:

1. Description of the determined components of the time series which allows to work out a forecast and to model a future course of the series.

2. Assessment of the dispersion of the time series which allows proving the idea of reliability and quality of the forecast.

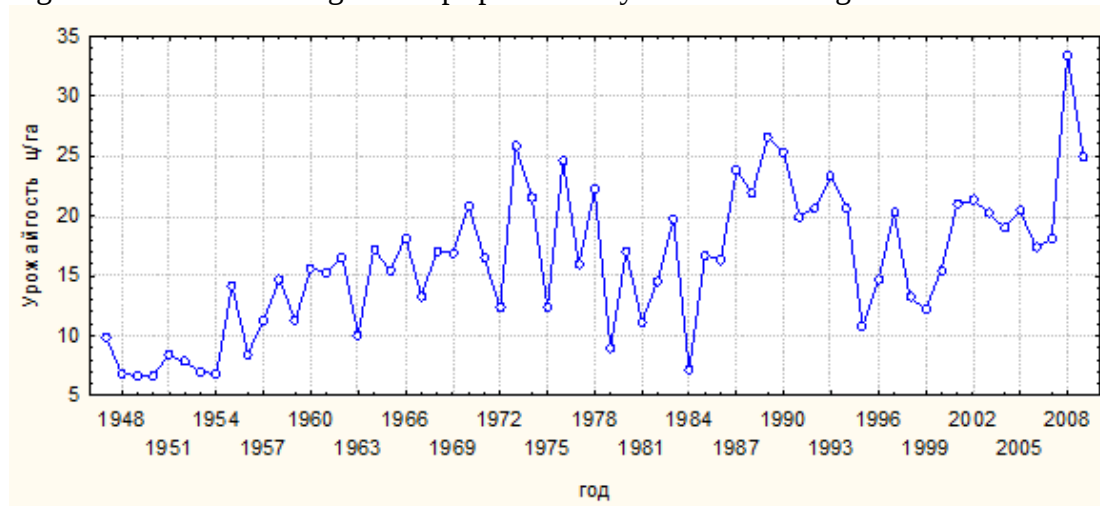
3. Testing of the stationarity of the time series remains which allows to be convinced of correctness of the components determined

earlier (determinancy of nonrandom components), on the one hand, and random influence of unrecorded factors, on the other hand.

As the basic we use the data of grain crops production in Voronezh region in 1947-2009. It is possible to see the graphic representation of the basic data in figure 1.

It is known that while searching of the tendency (the determined component) it's appropriate to reject a part of last data if they reflect invalid regularity of past development. Visual research of the time series presented in figure 1, allows coming to a conclusion that in 1969 there were some qualitative changes. Therefore we consider that for the further analysis it is necessary to take only the data for the last 42 years which schedule looks more homogeneously.

Fig.1. The basic data of grain crops productivity in Voronezh region in 1947-2009.



The assumption certainly demands some statistical confirmation and substantial justification. Therefore we will divide the time series into two pieces: the first - from 1947 to 1966, the second - from 1967 to 2009. For checking of uniformity of these two intervals of a time series we use the Comparing Two Independent Groups module from STATISTICA system [2].

In figure 2 it is possible to observe visually the distinctions of medians and IQR of two pieces of the time series. The variation of the second interval of the series exceeds the corresponding variation of the first interval but the medians differ considerably. The same characteristics of the series intervals can be tracked comparing the histograms constructed on received data (fig. 3).

Fig.2. Charts of the range of two intervals of the series

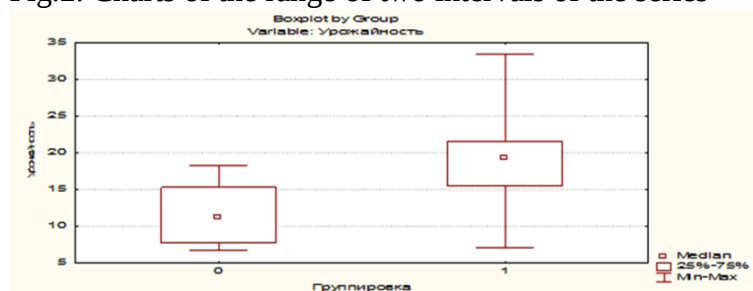
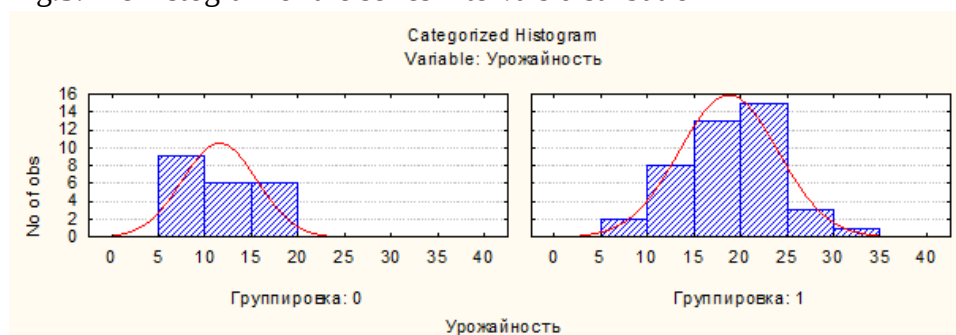


Fig.3. The histogram of the series intervals distribution



Considering two received intervals of a time series as independent samples and supervision comparing to their rather small volumes - 21 and 42 Mann - Whitney's criterion, Vald -Volfovits' criterion and Kolmogorov-Smirnov's two-sample criterion have been used for comparison [2, page 506-507]. The results of all these criteria allow surely (on a significance value less than 5 %) rejecting the hypothesis about the uniformity of the considered samples. In other words, it is possible to approve with more than 95 % reliability that considered samples differ not only in average values, but also in a distribution form.

Besides, it is necessary to take into consideration some substantial reasons. So, since 1966 after March (1965) Plenum of the Central Committee of CPSU at which the decision of heavy capital investments in mechanisation, chemicalization, melioration and other needs of agriculture has been made, there has come qualitatively new stage of mainly intensive development of agricultural production. [9, page 23]. Descriptive statistics of the series interval used in further researches, are given in chart 1.

Chart1. The descriptive characteristics of the time series intervals

Variable	Descriptive Statistics (Date_1967_2009)						
	Mean	Std.Dv.	Minimum	Maximum	First Case	Last Case	N
Урожайность	18,43571	5,316372	7,100000	33,40000	1,000000	42,00000	42,00000

It is possible to note that in comparison with the whole time series (63 cases of survey) an average value has grown (18,44 to 16,26 c/hectares), and the mean-square deviation has a little decreased (5,32 to 5,91).

The linear regression model [10], made for the purpose of the trend selection, looks like

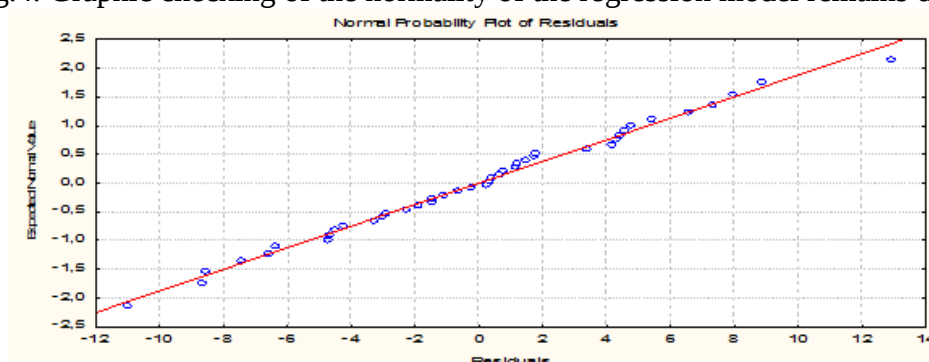
$Y_t = 16,185 + 0,105X_t$ and is not significant for the standard 5% level. The results of the model calculation are given in chart 2.

Chart 2. The results of the regression model calculation on the data of the baseline time series

Regression Summary for Dependent Variable: урожайность (Date_1967_2009)						
R= ,24160095 R²= ,05837102 Adjusted R²= ,03483029 F(1,40)=2,4796 p<,12321 Std. Error of estimate: 5,2230						
	Beta	Std. Err. of Beta	B	Std. Err. of B	t(40)	p-level
N=42						
Intercept			16,18467	1,641063	9,862311	0,000000
номер	0,241601	0,153430	0,10470	0,066490	1,574667	0,123211

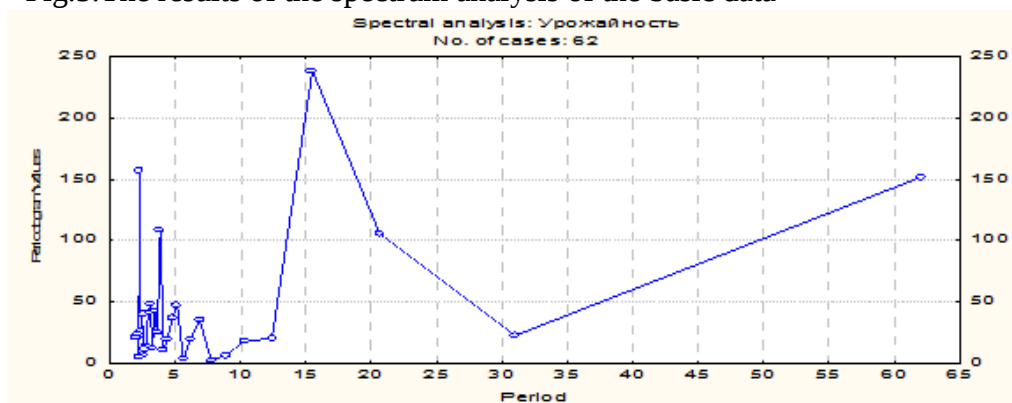
Practically it means that for this time interval (1947-2009) the average productivity in Voronezh region was 16,18 c/hectares, and all deviations had random character and statistically were not significant. And though the received distribution of the remains does not contradict the hypothesis about a normality of their distribution (fig. 4), it is impossible to consider this equation correct for the grain productivity forecasting.

Fig.4. Graphic checking of the normality of the regression model remains distribution



For determination of a periodic component the results of the spectrum analysis are usually used. For this purpose we will use the Spectral (Fourier) analysis module in STATISTICA system [7, page 490]. The results of the spectrum analysis are given in figure 5. The sharp peak on the value of 16 testifies to existence of the cyclic component with the period equal to 16.

Fig.5. The results of the spectrum analysis of the basic data

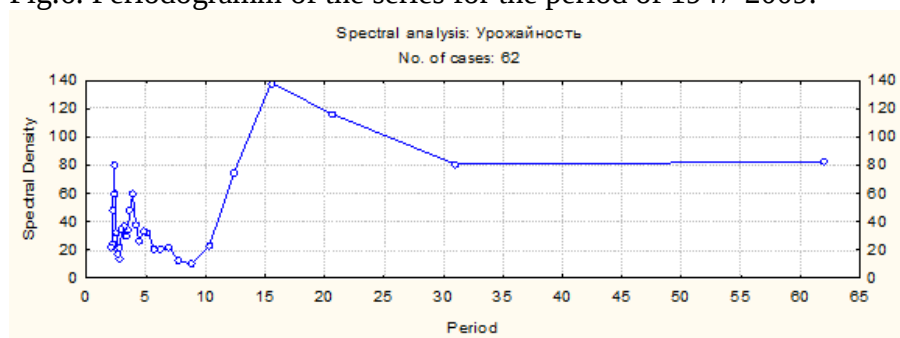


Besides, the analysis of the correlogram data confirms that there is a cyclic component with the period of 16 years in this series. Thus, there are rather convincing arguments to consider dynamics of grain productivity growth as the process having a regular cyclic component. For finding of such periodicity we use Spectral (Fourier) analysis modules (Fourier's spectral analysis) which results are presented in figure 6.

The narrow high peak testifies to existence of regular cycles, and wide peak (badly created because of insufficiency of data) - about irregular, unstable cycles.

The carried-out spectrum analysis of the data for the period (1969-2009) showed that substantially this schedule reminds the one in drawing 6, and confirms the conclusion about existence of a cyclic component in the series data though this statement looks already not as convincing as it is based on a smaller number of surveys.

Fig.6. Periodogram of the series for the period of 1947-2009.



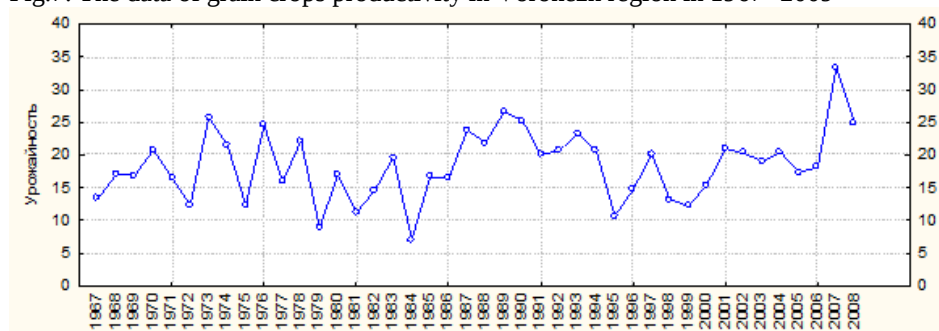
For checking of the series remains stationarity and the assessment of its dispersion it is convenient to use such widespread characteristics as a sample autocorrelation function and the function, what is more exact - its selective characteristic, the private autocorrelation function [2], [7]. The received results, in particular the constructed

borders of the confidential intervals, allow to make the conclusion that the residual part of a series is the white noise.

The results of using the Singular – Spectrum Analysis of grain crops productivity in Voronezh region

The method of the singular-spectral analysis has been used by us for the analysis of yielding capacity data in Voronezh region, taken for the period (1967-2009). The short description of the SSA algorithm is cited in appendix 1 are presented.

Fig.7. The data of grain crops productivity in Voronezh region in 1967- 2009



As a part of crops variability in the visual analysis it is possible to distinguish chaotic fluctuations, they are random changes of factors and some tendencies characterising regularities of development, periodic waves. The results of the visual analysis visually show that since 1967 recurrence in grain productivity has been developing much more accurate than earlier. For carrying out the SSA the size of a window equal to 16 was chosen. The size of the window is almost the only input parameter of the algorithm. It is necessary to choose its size so that this interval of a series contains the main information about the structure of the studied process. As the preliminary analysis of the series (see above) indicates the existence of the cycle with the period close to 16, we decided to choose this value as an input parameter. The carried-out calculations with other values of the parameter have confirmed correctness of such choice: in quite a wide range of values of this parameter the results of the algorithm work show stability.

The results of calculation of the first six components are presented in fig. 8.

The visual analysis allows making the following conclusions.

1. The first component represents a steadily changing trend close to the linear. Approximation of this trend by a linear function leads to

the equation ($Y = 16,70 + 0,06X$), which is significant at the level less than 0,01 %, and the determination coefficient $R^2=91\%$. The standard mistake in the regression equations is 0,25. It indicates reliability of the constructed model and its suitability not only for the analysis of the initial data, but also for forecasting.

2. The second and third components are the periodic ones having as it are possible to see on the graph, a clearly defined cycle during 16 years. On the whole it is possible to consider the first three components to be the determined components of the series.

3. Components 4, 5 and 6 represent the high-frequency modulated harmonic components. All the other components have the similar performance – the difference is that their amplitudes decrease. The difficulties connected with the estimation of their period are known – the nature of the data does not allow estimating the cyclic processes when the period is less than a step of the time series in principle, in our case it is one. Therefore these components and the subsequent ones are considered to be a random component.

Let's note that for the selection of the components, representing the determined component of a time series, use also the criterion based on value contribution of eigenvalues, corresponding to these components. In our case it makes 95 %.

It is possible to see the final decomposition of the time series in fig. 9 where the baseline data are presented: values of the time characteristic (years) are on the axis of abscissae, and the corresponding values of yielding capacity (c/hectare) are on the axis of ordinates. For comparison the decomposition results – series decomposition on the determined and random components are presented in the same figure.

The root-mean-square deviation of the basic series (1969-2009) has made 5.32 while the determined trend component has the root-mean-square deviation equal to 0.85, and a cyclic component is 1.97. The comparison of these results shows that the carried-out decomposition of a time series allows separating a trend component, having an average mean square deviation, more than 6 times smaller, than in the basic data. An average mean square deviation of the second component is equal to 1.97 that is 2.3 times more than the first component has.

Fig.8.The results of the time series decomposition of the in grain crops productivity in Voronezh region

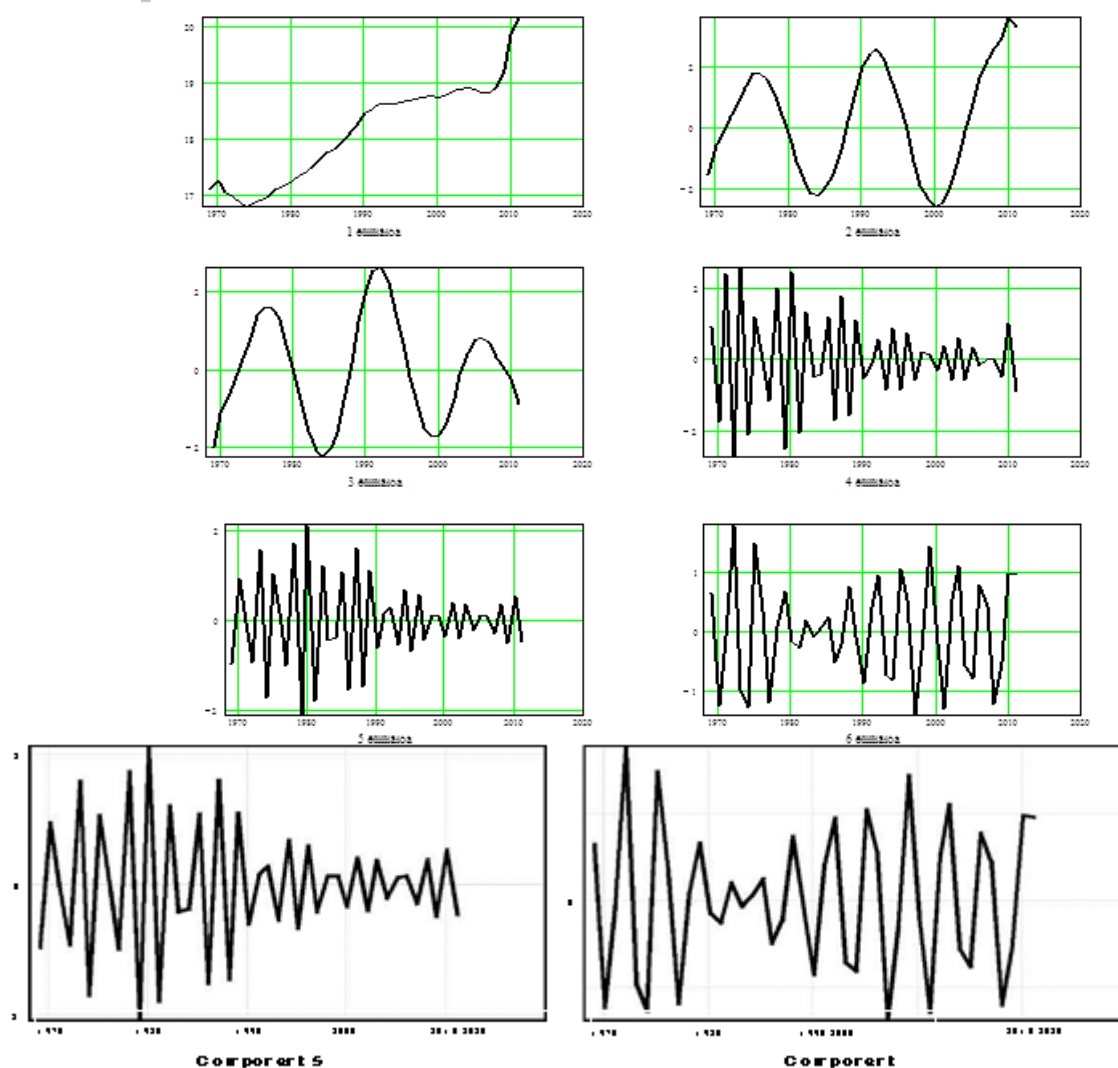
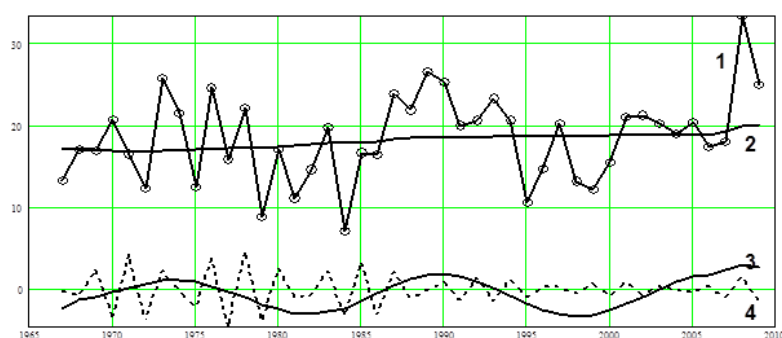


Fig.9.The studied time series and its decomposition: the crop productivity in Voronezh region-1, the trend-2, the cycle component- 3, the residual chaotic component- 4



The econometric model, constructed on the basic data, is insignificant at the standard 5 % level. As a matter of fact it means that such a model is unsuitable neither for the analysis, nor for productivity forecasting.

For approximation of the received dependence using for the forecasting, we have used cubic spline approximation of MATHCAD [5, page 368], [6, page 166]. Let's notice that quality of such a forecast, having values of the series argument considerably far from the last value of a series, is insignificant. In such situations methods of adaptive forecasting [4, page 79] will be more adequate.

In our case the result of the forecast for the year 2010 is 17,59 c/hectares.

The assessment of the approximation accuracy was carried out taking into account that the determined component contains a cyclic component, and the amplitude of the cyclic process does not remain constant but has a tendency to change as far as the total index changes. The existence of such a component leads to the fact that the estimation accuracy will not be proportional in the whole sector of forecasting but will depend on a cycle phase of the forecast and that's why it is meaningful to consider values of deviations in each point of the determined cyclic component separately instead of taking average values. Both root-mean-square and average values of absolute deviations have been used as estimates. However the difference in estimating the deviations values is not crucial.

Taking into account the values of the root-mean-square deviations for the constructed points (the forecast horizons), the mistake will make 5,6 in the first case and 5,3 in the second one. Thus, the forecast for the year 2010 with the calculated deviations in case of the root-mean-square mistake will give from 11,84 to 23,34 c/hectares. Predicted values coincide well with available real data of 14 c/hectares.

Mistake will give from 11,84 to 23,34 c/hectares. Predicted values coincide well with available real data of 14 c/hectares.

The technique of productivity forecasting considered above was tested on the data of 1967-2008 in the same way and coincided with the available data on productivity for 2009.

Conclusion

The knowledge of the time series decomposition, character of the trend and the type of the prevailing variability has a considerable practical value for forecasting and working-out of actions for sustainable development of such a branch of agricultural production as plant growing. This information will be especially useful for the reduction of productivity fluctuations or overcoming their negative consequenc-

es. So, with the prevalence of a high-frequency productivity fluctuation considerably smaller insurance reserve is required, than at a long-period variability of equal intensity for production shortage during the first of them will be compensated by its excess over the average level of the trend next year, while during the second one some years with a production shortage will follow one by one, for example [9, page 70.].

The received results are important for the crops insurance upon a crop failure. So, if in studied (Voronezh) area bumper-crop and lean years can repeat in series, it will be necessary to provide the possibility of insurance supply laying for compensation of shortages during a certain period. Similarly reserve capacities of granaries should be ready to provide crop preservation during the periods of harvesting exceeding the average level.

APPENDIX 1. Description of the Singular-Spectrum Method (SSA)

One of the main advantages of this method is absence of any aprioristic assumptions concerning a trend type of a series. For the analysis we will carry out the time series decomposition, i.e. we'll present it as a sum of simple summands. The advantage of this method is that it does not demand setting of parametrical model of a series and allows to determine additive components of a time series, both trend and periodic.

The essence of the method is in a time series representation as the sequence of a certain length vectors with the subsequent analysis of the received linear structure by a main component method. The algorithm of the SSA method can be presented in the form of the following sequence: investment, singular decomposition, grouping and diagonal averaging. Thus the first two steps - an investment and singular decomposition are called the decomposition in aggregate, and following two - grouping and diagonal averaging are the restorations.

Investment. Let's consider a time series $\{ a_i \}_{i=1}^N$, formed by sequence N of equidistant values. The key parameter of the SSA method is the so-called length of a window L, and $1 < L < N$. Using this parameter, formation of a so-called trajectory matrix A is made by the following rule. As the first column we'll choose L of the first values of a series $a_1, a_2, \dots, a_L$, as the second column – the values $a_2, a_3, \dots, a_{L+1}$, etc. Using all the components of the series we'll get the following matrix with the size $L \times k$, where $k = N - L + 1$.

$$A = \begin{pmatrix} a_1 & a_2 & \dots & a_k \\ a_2 & a_3 & \dots & a_{k+1} \\ \dots & \dots & \dots & \dots \\ a_L & a_{L+1} & \dots & a_N \end{pmatrix}$$

Singular decomposition. For convenience of the further work we will make standardization of the matrixes elements and turn to a matrix A^* . For the received matrixes A^* we will calculate $S = A^* (A^*)^T$ matrix of correlations factors and we will define for S matrix its own values and its own vectors U_i , from the formula

$$S U_i = \lambda_i U_i, (i = 1, 2, \dots, k).$$

As the matrix S is a symmetric and nonnegative definite matrix, its own values will be valid and non-negative ($\lambda_i \geq 0$), and therefore they can be ordered in not decreasing order $\lambda_1 \geq \lambda_2 \geq \dots \geq \lambda_k \geq 0$. The own matrix S vectors will be orthonormalized $U_i U_j^T = \delta_{ij}$ owing to the linear independence and form U matrix $= (U_1 \ U_2 \ \dots \ U_k)$ which is orthogonal or a rotation matrix. For $\lambda_i > 0$ we will construct a vector $V_i = \lambda_i^{-1/2} (A^*)^T U_i$ which will be own vector of a matrix $(A^*)^T A^*$ corresponding to its own number λ_i . In this case vectors V_i and U_i are called the right and the left singular vectors of A^* matrix, and $\sqrt{\lambda_i}$ numbers are singular numbers. Thus it is possible to prove that equality will take place

$$A^* = \sum_{i=1}^k \sqrt{\lambda_i} U_i V_i^T \quad (\Pi 1)$$

or if we take into consideration the matrix $A_i^* = \sqrt{\lambda_i} U_i V_i^T$, it is possible to present the decomposition in the form of $A^* = \sum_{i=1}^k A_i^*$. This decomposition is called a singular decomposition of the matrix A^* . The set $(\sqrt{\lambda_i}, U_i, V_i)$ is called i - own trey of the matrix A^* .

Grouping. On the basis of decomposition (II1) the selection of matrixes of $A_i^* = \sqrt{\lambda_i} U_i V_i^T$ is made. Thereby the initial decomposition can be written down as

$$A^* = A_{j_1}^* + A_{j_2}^* + \dots + A_{j_K}^* \quad (\Pi 2)$$

Where $j_1 + j_2 + \dots + j_K = k$. At this stage there is a selection from the general set of all own treys of those ones which will enter into the series restoration. Visual and analytical studying of the components, received as a result of the decomposition, can give a lot of interesting information on the structure of the studied process and characteristics of its summands.

Diagonal averaging. On the last step each matrix of the received decomposition is transferred to a new series of length N. Before it we carried out the denorming- all the elements of the columns of A^* matrix are multiplied on corresponding values of the standard deviations s_j , then goes the decentering - adding the corresponding selective averages $\bar{a}_i$ to the elements of each column.

The matrixes A_j received after the transformations are transferred to a new series of length N by means of the diagonal averaging which is carried out by the formula

$$f_k = \begin{cases} \frac{1}{c} \sum_{j=1}^c a_{j,c-j+1} & , \text{ если } 1 \leq c < L^* \\ \frac{1}{L^*} \sum_{j=1}^{L^*} a_{j,c-j+1}, & \text{ если } L^* - 1 \leq c < k^* \\ \frac{1}{N-c} \sum_{j=c-k^*+1}^{N-k^*+1} a_{j,c-j+1}, \dots & \text{ если } k^* \leq c < N \end{cases} \quad (\Pi 3)$$

The formula (Π3) corresponds to the averaging of the matrix elements along the "diagonals" $i + j = c + 1$, i.e. for $c=1$, $f_1 = a_{11}$; for $c=2$, $f_2 = \frac{a_{12} + a_{21}}{2}$, etc. Having applied the diagonal averaging to the earlier received matrixes, we come to the decomposition of the initial series to the sum

$$a_i = \sum_{j=1}^K f_j \quad (i=1, 2, \dots, n).$$

Let's note the interesting fact that if to apply the averaging operation directly to the trajectory matrix A, the received series will coincide with the initial time series $\{a_i\}_{i=1}^N$.

The algorithm of the SSA method presented above has been represented by the authors in MATHCAD.

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ESSENTIAL CERTAINTY OF FINANCIAL STRATEGY OF AN ENTERPRISE DEVELOPMENT

Аннотация: В статье отражена необходимость трансформации взглядов на целевые ориентиры разработки финансовой стратегии коммерческой организации в современных условиях хозяйствования. Доказывается необходимость использования финансовой стратегии развития предприятия и формируется ее сущностная определенность.

Ключевые слова: финансовая стратегия, предприятие, долгосрочный план, долгосрочная цель, распределение ресурсов, корпоративные, конкурентные и функциональные стратегии, экономическая система.

There is no identical opinion of scientists about the concept “strategy” in scientific literature. R. I. Akmaeva [1] defines the strategy as the concrete long-range plan of achievement in long-range target. The long-range plan is based on condition that all changes in the environment are predictable, deterministic. And all these changes are submitted to absolute control and management.

I. Ansoff [4] proposes the following definition of the strategy. The strategy is one of several rules sets to decide regarding the behavior of the organization. In A. Chandler’s proceedings [13] the strategy is considered as a method of long-range target’s fixing of the organization, the program of its operations and priority guidelines to allocation of the resources.

According to G. B. Klainer formulation the strategy is the summation of the interfacing decisions that indicate the priority guidelines to allocation of resources and the enterprise efforts of performing its mission.

A.A. Thompson, A. G. Strickland [11] come to the conclusion that strategy is the set of operations and methods to achieve of the proposed performance index.

G. Minzberg [8] believes that the strategy is the plan, some form of a certain developed activities sequence.

Consequently, we will interpret the enterprise strategy as the general work plan of operations determining priorities of the strategic tasks, resources and sequence of steps to achieve strategic targets. The main task of the strategy is to transfer the enterprise from its real state to the future one wished by the management.

In literature there is a variety of different classifications of strategy of an enterprise based on fixed signs. So depending on the level of the made strategical decisions corporate, competitive and functional strategy are marked out [9].

Corporate (basic, portfolio) strategies apply to the general orientation of the enterprise development or as a whole the integrated (corporate) economic system. The main target of the basic strategy is the choice of those reference points and elements of the system to which it is necessary to send appropriate resources and investments, and also instruments of management which allow receiving the necessary level of effective strength and stability. At the heart of such strategy is re-

sources allocation between subdivisions on the basis of the portfolio analysis; diversification of production for the purpose of economic risk decrease and synergy achievement; modification of organizational structure of corporation; elaboration of the united strategy of subdivisions development.

Competitive strategy extends on the definite economic subdivisions of the enterprise. Their purpose is to provide effective realization of business plans of the separate processes development, the courses, and divisions on the basis of the optimal list of actions formation. At this point trends for possible financial backing of production of new produce, refusal of the existing unpromising products are considered. There are come out production, price, advertising, marketing and other strategic initiative in the certain market or in the market segment.

Functional (business, competitive) strategies are accepted in the interests of the enterprise departments operating. Each functional structure (production, marketing, finances, Research and Development, the staff) projects the level of financing and management instrumentation as a way to achieve the local purpose of process, function, subdivision. Development of competitive positions or effective behavior in the context of the defined function is the purpose of such strategy. Most of the economists note the key importance of financial strategy in the system of the enterprise functional strategy. N. N. Ilysheva [6] for example explains the role of financial strategy as the coordinating role of finances in system of management of the organization, and also that special place which is taken by financial resources. They can be converted in any other resources category with the minimal time lag. I.A. Blanck [5] interprets the financial strategy as one of the most important types of the enterprise functional strategy securing all main directions of its financial activity development. The functional strategy secures financial relations by formation of the long-term financial objectives, by a choice of the most effective ways of their achievement, adequate correction of the directions of formation and use of financial resources at modification of environment conditions. Modern enterprise operating conditions must be considered. Factors of the external and internal environment are very mobile

in these conditions. Therefore the organizations have to choose the strategy focused on the development.

V. V. Frolova [12] is of the opinion that there are some strategies of the enterprise development connected with a stage of its life cycle:

1. Growth strategy – basic strategy evaluating tendency to increase production, profit, capital;

2. Stabilization strategy – the strategy of the enterprise activity in the conditions of instability of sales result and proceeds, as reactions to external pressure from the environment;

3. Strategy of a survival – defensive branching (it is applied in case of full disorder of the enterprise business activity, when it is in the position close to bankruptcy). Such strategy is often called anti-recessionary [10].

A.A. Andreyeva [3] marks out two basic strategies chosen by the enterprise, considering the level of its economic potential, a stage of life cycle and the position taken in the market: development strategy and strategy of survival.

In R. Akoff's [2] proceeding, development is a question referring not so much to the available goods, as to what can be made with them. Development means change of the enterprise economic situation, consisting in transfer from one state to another which is considered to be the best, more effective or expedient for activity.

The strategy of survival is referred to in case of the enterprise activity index decreases. No measures change these tendencies.

At the same time in our opinion, it is necessary to elaborate a specific type of financial strategy, namely financial strategy of the enterprise development for formation of material and technical basis of the enterprise development. We interpret specific type of financial strategy as the general plan of operations to provide the enterprise with monetary assets and financial resources to transfer from one state to another, more effective or expedient for the activity.

Thus, from our point of view, a guideline is the enterprise of financial strategy development use. Its practical aspect of realization is of interest to further research which will lead to the success and survival of the functioning business in the conditions of the protracted period of turbulence of the national economic.

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THE APPLICATION OF IFRS IN DOMESTIC PRACTICE

Аннотация: На протяжении последних лет мы активно идем к сближению российских стандартов бухгалтерского учета и международных стандартов. Однако на сегодняшний день это является проблематичным ввиду недостаточного числа специалистов в области МСФО. Целью исследования было изучение проблем и возможностей перехода от национальных стандартов к международным стандартам. Мы внесли предложения по повышению уровня подготовки специалистов. Это, в свою очередь, приведет и к снижению затрат на услуги внешних специалистов. Подводя итоги, мы пришли к выводу, что отчетность, подготовленная в соответствии с МСФО, повысит интерес иностранных инвесторов к отечественным компаниям.

Ключевые слова: Международные Стандарты Финансовой Отчетности, консолидированная отчетность, инвестиции, отчет о движении денежных средств.

At present, the introduction of International Financial Reporting Standards in Russia remains a very important problem. Along with positive sides of corporations IFRS, there are some problems and contradictions. To understand more, we should consider the positive and negative moments in RAS and IFRS and the transition of the Russian system to IFRS and the ways their solution.

Russian accounting standards (RAS) is a complex of federal laws and regulations of accounting (PBU) issued by the Ministry of Finance of the Russian Federation that regulate the accounting rules [1].

International Financial Reporting Standards (IFRS) is a set of documents (standards and interpretations), regulating the rules of

compilation of the financial statements required by external users for making economic decisions for the enterprise [1].

According to the documents of the Russian system the regulatory accounting system should provide true and complete picture of the financial situation of the organization, the financial results of its operations and changes in its financial position (p. 6 PBU 4/99) [5].

In IFRS the general purpose of financial reports is to provide information about the financial position, financial performance and cash flows of the company, which is useful for a wide range of users in making economic decisions. Financial reports also show the results of resource management, entrusted to the managers of the company. (p. 7 of IAS 1) [5].

Despite the fact that the RAS and IFRS are similar, IFRS puts more emphasis on the disclosure of reporting data for a wide range of users, such as actual and potential investors, employees, creditors, suppliers, customers, governments and their agencies, the public, whereas the preparation of financial statements is only a formality for RAS. It is worth noting that in IFRS giving the disclosure to investors is a priority among all users. However, these statements are important for managers in making important administrative and economic decisions.

The necessity of transition from the Russian accounting to the international standards is due to the fact that many foreign investors and lenders believe that accounting does not correspond to the international standards, and the information contained there is "not clear and unreliable".

Accounting reform begins in 2010 with the adoption of the Federal law on 27.07.2010 No. 208-FZ "About the consolidated financial statements." This act was the following: "IFRS and IFRS clarifications, admitted by the Committee of international financial reporting standards and accepted in the manner prescribed by the legislation of the Government of the Russian Federation on agreement with the Central Bank of the Russian Federation are applied on the territory of Russia.

In addition, the following steps were performed on the convergence of IFRS:

1) there was a resolution of the Government of the Russian Federation of 25.02.2011 No. 107 "On approval of the regulations on the recognition of international financial reporting standards and Interpretations of international financial reporting standards for using on the territory of the Russian Federation";

2) of the Ministry of Finance from 02.07.2010 No. 66n new forms of financial statements were approved;

3) according to the order the Ministry of Finance from 02.02.2011 No. 11n new PBU "Report on cash flows" were approved;

The necessity for reporting in accordance with IFRS is based on the following reasons.

Firstly, the largest organizations and holding companies are interested in attracting investment. For investors, the perspicuity and reliability of information are necessary conditions [4]. On this basis, the corporations have to make the transition to international standards.

Secondly, the owner of the organization on its own initiative, can require the report on IFRS, because with its help, you can evaluate the real situation of the company.

Thirdly, the financial reports according to international standards are an important tool in making management decisions.

Russia takes active steps to convergence with IFRS, however many problems remain unresolved.

The most common problem is staff training. Initially the corporations called the external consultants to prepare some reports for the external users. Currently, there arises the question about training of personal specialists of the organizations. However, it is much more expensive than appealing to an external assistance. In order to increase the number of specialists in this field, it is necessary to take the following steps:

1. to organize a massive staff training with the subsequent certification.

There are several international programs dealing with training of accountants working on IFRS [2]:

- ACCA (United Kingdom)-the Association of Chartered Certified Accountants.

- CAP/CIPA-the international certification of Accountants for the CIS.

2. Except the theoretical knowledge accountants need practice. That's why it is important to send specialists to exchange experience to the country where IFRS has a widespread use. It is also logical to invite leading experts for seminars on the application of IFRS, to analyse the particular cases in practice, etc.

3. As the official language in international financial reporting standards is English, it is necessary to have knowledge of language at a high level.

4. A positive point will be the promotion of employees by premiums in accordance with their level of qualification. So, this should be a motivation for further self-study training.

Hiring specialists on IFRS, the employer essentially is based on the following requirements:

- knowledge of English;
- experience in European companies;
- working experience in renowned consulting and auditing firms;
- knowledge of ERP systems: from "1C: Enterprise" and ending with JD Edwards, SAP and Microsoft Dynamics;
- presence of one of the recognized certificate in the world by international standards: ACCA, CIMA, CPA or DipIFR.

Transiting to IFRS it is also necessary to consider the interests of the state, relating to income from the tax burden of the organization. It is real by enabling improvements in tax accounting.

The important point is the question, whether to transit to IFRS or not.

At this stage, many corporations are reporting on double standards, RAS and IFRS.

It should be mentioned that IFRS are mainly used by the large organizations that want to compete on the international market, to cooperate with western investors and creditors. Such representatives are "Gazprom", RAO "UES of Russia", OJSC "MMC Norilsk Nickel", JSC "Russian railways", JSC "Aeroflot" and others [3].

At the same time, the national system of financial reporting, which is used by private companies, continues to exist. However, it must have some changes in the future, some international standards, which are not similar to the Russian standards, will be fully taken from IFRS. According to the Ministry of Finance, the maximum convergence of RAS and IFRS should be finished by 2015.

An interesting point is the fact of reporting and record keeping. Russian accountants make entries on the basis of the document, within the strict framework. Accountants, who keep records and account reports in accordance with IFRS, have more "creative" approach. They come from the economic entities of the operation, ensuring the correctness of the entry, and their economic justification to the auditors.

The problem of transition of the Russian accounting system to a system of international standards remains relevant at this stage of the development of accounting and reporting. Preparation of statements in accordance with international standards provides investors with necessary information for capital investment in the company, and also is a powerful financial tool in the hands of the leader. At this stage of the transition to IFRS is excluded because of the risks of change and lack of intellectual property rights to the appropriate standards, but, despite this, we are confidently moving towards the convergence of the two standards.

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CURRENT STATE AND PROSPECTS OF THE BANKING SYSTEM DEVELOPMENT OF THE RUSSIAN FEDERATION

Аннотация: В статье определяется понятие банковской системы, представляется структура российской банковской системы. Авторами охарактеризовано современное состояние банковской системы Российской Федерации, а также предложены пути повышения эффективности деятельности банков.

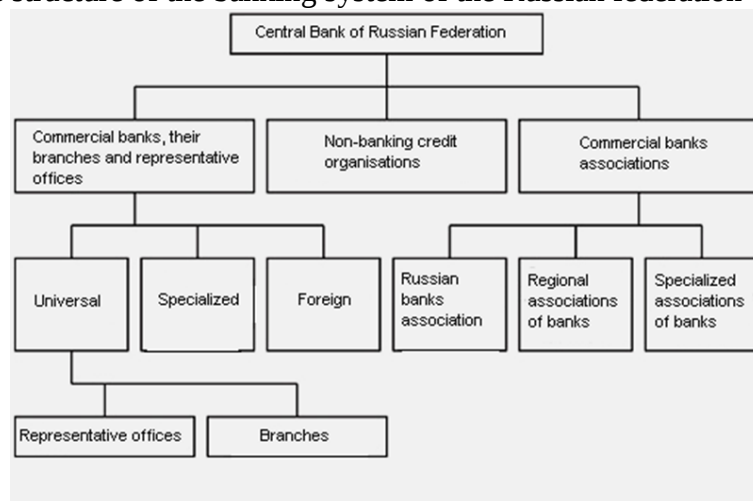
Ключевые слова: банк, банковская система, структура банковской системы РФ, Центральный банк, коммерческие банки, небанковские кредитные организации.

A need to develop an adequate financial infrastructure, including financial markets, appears as a result of the market economy development. Society banking system operated in the banking market (primarily credit resources trading) finds the own development in connection with the evolution of industry, trade and the financial system.

The banking system is a subcollection of various types of national banks and credit institutions operated under a common monetary mechanism. This dynamical-developed system includes the Central Bank, commercial banks and other credit and payment centers.

The Russian banking system has a bimodal structure. The first level is represented by the Central Bank of the Russian Federation. The second level includes banks and non-banking credit organizations, branches and representative offices of foreign banks. Banking system elements is presented in figure 1 [0].

Figure 1. The structure of the banking system of the Russian federation



The first level includes the Central Bank of the Russian Federation, which functions nature and authorities distinguish it from the other banks. Primarily this is the establishment and methodical provision of the rules of settlement and banking accounting, the cash emission, the organization of payment transactions, licensing of banking activities and supervision of credit institutions, the regulation of banks and the other lending institutions with the aid of account policy, reserve policy, establishing mandatory economic standards. Because of its own functional purpose the Central Bank of the Russian Federation takes the special place in the banking system.

The second level of the banking system includes the credit institutions like the bank and non-banking credit organization, the Russian foreign capital banks or branches of foreign banks. The primary purpose of the credit institutions is conducting of banking operations including credit service, cash service and deposit service for customers and the other subjects of economic attitudes.

The state of the banking system is very dynamic today, because the reduction of credit institutions continues. According to the Central Bank of the Russian Federation the number of commercial banks and non-banking organizations with a valid license on 20 August 2014, amounted to 872 pcs. Only 418 pcs of credit institutions (47.9 per cent) can be attributed to the large-sized of the authorized capital.

The number of banks, operating in Russia, is coming down every year. There were 778 commercial banks at February, 1, 2015 in Russia. The number of credit organizations operating in the Russian Federation is presented in the table 1.

Table 1. The number of credit organizations of the Russian Federation, 2013-2015 (at January, 1)

Activities	2013	2014	2015	Departure (+/-)	Growth rate, %
The number of credit organizations	897	859	783	-114	-12,7

783 banks operatet in Russia on January,1, 2015, 859 banks on January, 1, 2014, 897 banks on January,1, 2013. Thus the banking system of the Russian Federation decreased to 114 banks for three years. The banking system of Russia decreased by 5 banks during 2 months 2015 [3].

Reducing the number of banks is going under different scenarios. The number of processes associated with the absorption of smaller banks by larger others, junction of capitals of several banks, and the self-liquidation or liquidation per curiam has increased significantly due to the level of minimum size of the authorized capital raising by the Bank of Russia. Cases of banks liquidation take place in connection with an abuse of law. Reducing the number of banks is not a negative trend. The main criteria of banks activity efficiency are the quality of capital, the quality of risk management, the internal control system and resource allocation, liquidity management, customer number, etc. The following factors influence the banks activity efficiency:

- absence of new "growth points";
- changing for the worse of asset quality;
- systemic deficit of liquidity;
- strengthening of the regulatory supervision.

Banks will have to work in conditions of low growth and declining profitability in the future. It will demand business models updating from them. Otherwise banks will have to abandon high-risk business or questionable activity and to leave the market of banking services.

The different groups of indicators are using for appraisal of the banks activity effectiveness and their financial sustainability:

- the activities of capital's appraisal;
- the activities of asset's appraisal;
- the activities of appraisal of the quality of bank management, risk management, it's operations;
- the activities group of appraisal of profitability and liquidity.

Data of activities of capital's appraisal are presented in table 2.

Table 2. Activities of capital's appraisal of large credit organizations of the Russian Federation, 2012-2014 (at November, 1), thousand rubles

Names of credit organizations	2012	2013	2014	Departure (+/-)	Growth rate, %
Sberbank of Russia	1 573 389 751	1 936 333 041	2 170 132 505	596 742 754	38
Vneshtorgbank	519 064 964	646 849 646	527 873 031	8 808 067	2
Gazprombank	-	416 081 392	417 234 866	1 153 474	0,3
Alpha-bank	171 129 247	192 094 876	260 189 329	89 060 082	52
Vneshtorgbank - 24	146 605 845	179 598 502	249 797 172	103 191 327	70
Rosselkhozbank	171 921 255	196 625 504	248 700 635	779 380	45

The activities of the banks efficiency increased every year in spite of the number of credit organization reduction. So, the capital of the "Vneshtorgbank -24" has grown up at 70 per cent for three years, " Alpha-bank " – at 52 per cent, "Rosselkhozbank" – at 45 per cent, of the "Sberbank of Russia" – at 38 per cent, of the "Vneshtorgbank" – at 2 per cent, "Gazprombank" - at 0.3 per cent. Data of the table 2 demonstrate the stability of these credit institutions [3].

According to the forecasts of financial experts and analysts the banking sector will expect global "perestroika" in 2015. Many banks will be forced to revise their models of development and will face with increasing requests for debt restructuring by large enterprises, while many retail players have experienced the degradation of their portfolios already. They also will be forced to change their development strategies to maintain profitability amid a slowdown in the major segments of lending. The question for small players is increased susceptibility to panic by loans. Access to short-term liquidity on the interbank market for them is limited, whereas, the flows liquidity do not deliver to the small credit institutions, remaining in large banks [2].

The increase of the banks activity efficiency is directly linked to the public-private partnership by:

1. strengthening of program-target components in the government's activity;
2. transition to project-based forms of interaction between government and business on the basis of co-financing of projects, implementation of project funding on the state level;

3. making government decision about the working out Strategy of the banking sector development of the Russian Federation up to 2020, involving academic experts and practitioners, representatives of authorities.

This interaction may contribute to the growth of private investment and increase the efficiency of public investments.

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INTERDISCIPLINARY APPROACH TO ECONOMIC INVESTIGATION OF SOIL FERTILITY REPRODUCTION

Аннотация: Обосновано необходимость применения междисциплинарного подхода к экономическому исследованию воспроизводства плодородия почв. Выяснено сущность междисциплинарности в контексте формирования современной парадигмы исследований в аграрной экономике.

Ключевые слова: междисциплинарность, плодородие почв, рациональное использование, экономическое исследование.

Rational use of soil resources and soil fertility restoration is one of the hardest and the topicaletst theoretic and applied problems of modern agricultural science. The current paradigm of agricultural economy is reflected in the system of methodological guidelines that reflect patterns of sustainable development of the agricultural sector in

the context of globalization [1]. The relevance and significance of the problem of soil fertility reproduction in agricultural production is conditioned by a sharp contradiction between the need to ensure sustainable development of the agricultural sector and the intensive development of soil-degradation processes which prevent efficient and sustainable use of soil fertility reproduction.

Content of soil resources sustainable use is interpreted mostly ambiguous. There is reason to accept that the rational use of soil resources is one, in the process of which it is reached scientifically proven economic benefit of society and provided improvement of the environment, including soils as one of its main components. It should be followed the following condition: arable lands should be used according to the capabilities of the soil natural potential, taking into account the needs of control and increasing the fertility [2,p. 79].

It is important to note that in recent decades researchers and practitioners views on the content of soil fertility as an interdisciplinary category, as well as the fundamental principles of determining its performance are slightly changed, but unfortunately have not gotten closer. Research has shown that many central questions of soil fertility reproduction because of its extraordinary diversity and complexity as a natural phenomenon with many manifestations remain underdeveloped and debatable. The need to study the problem of rational use of soil resources and soil fertility restoration is significantly increased by the needs of building an effective organizational and economic mechanism of soil management in connection with the development of the European integration process and the formation of a qualitatively new internal and external environment of farms, which involves creating conditions for sustainable development of soil cover and suspension of degradation processes. The main idea of soil protection policies in European countries is warning of problems and implementing preventive principle, because soil is a limited resource that suffers under negative impact of the environment. However, fertility reproduction of degraded soils is much more expensive than preventive measures of degradation.

In modern conditions of reforming the agricultural sector of soil fertility reproduction has become of particular importance because of their potential fertility through the use of scientifically based fertilizer

standards and compliance required technology of growing technology makes it possible to increase crop yields significantly. However, in recent years a tendency to decline in soil fertility, particularly due to a significant decrease in the application of organic and mineral fertilizers, chemical meliorants. This is primarily explained by higher prices for them, reduced purchasing power of consumers, and the lack of favorable credit policy. Taking this into account in the decision of the Eleventh Annual Meeting of Ukrainian Congress of Scientists Agricultural Economists one of the tasks of research institutions and universities is determined expansion and deepening of theoretical and methodological principles of land relations, in particular towards the improvement of soil fertility of agricultural land [3].

Analysis of the problems associated with the logical culmination of land reform has shown that one of the priorities of science, including, of course, agricultural economics is a scientific support and rational use of land, conservation and reproduction of soil fertility [4]. Modern science, as evidenced by numerous publications, is actively seeking ways to improve its effectiveness in circumstances where there are intensive processes of differentiation, considered a prerequisite for the deepening research. However, there is a need to find ways to integrate scientific knowledge, which gives a significant effect [5].

At the present stage of scientific development a particular relevance is the problem of general scientific methodology as close to the processes of differentiation of scientific knowledge by branches its integration becomes important [6]. Integrative trends in science reflect interdisciplinary approaches and methods of learning that are occurred at the boundaries of different disciplines. Learning through the objects of social and economic nature allows gaining new knowledge. Interdisciplinary causes to facing different disciplines: enhanced integration processes, increasing interaction and mutual enrichment methods. This is especially relevant in times of crisis, when interdisciplinary communication is the successful resolution of a number of problems, to one of which probably it can be attributed excited problem of sustainable use of soil resources and soil fertility reproduction in agriculture.

It is known that scientific and technological achievements are exercised, usually on the verge of sciences, as a result of comprehensive research of facilities related problems. Under interdisciplinary

one understands a comprehensive study of a single subject of research by the various scientific disciplines. Interdisciplinarity is considered as a form of scientific knowledge organization based on certain relations between scientific disciplines, methods and technologies for solving complex technical problems. Interdisciplinarity is characterized by integrativity properties based on the transfer of research methods from one discipline to another. Interdisciplinarity requires synthesis obtained within different scientific disciplines results.

The term «interdisciplinarity» is used in different meanings, very close to this concept there are «polydisciplinarity» and «transdisciplinarity» which have some differences in interpretation. Polydisciplinarity means a joint study of some complex object by different disciplines (studying soil fertility by Soil Science, Agrochemistry, Ecology, Economics, Law, etc.). It is only defined opportunity for dialogue between the sciences, where every science has its own subject of study. Transdisciplinarity provides the outlet of research for disciplinary boundaries, thus there is a transfer of research schemes from one branch to another. Transdisciplinary research is a joint research project for several different fields of scientific knowledge. Interdisciplinary interaction involves communication in which each discipline is both autonomous and open one [7].

Among the short list of modern monographs on the issue of sustainable use and reproduction of soil fertility as a component of the biosphere and the component of the agricultural capital, that are marked by depth and interdisciplinarity research it is necessary to highlight the works [8, 9].

One of the first attempts from positions of interdisciplinary approach to reveal the current problems of the theory and practice of sustainable use of soil resources and soil fertility reproduction and to propose possible ways of their solutions is implemented in our monograph [10]. This paper presents theoretical-methodological and methodical and analytical-applied aspects of sustainable use of soil resources and soil fertility restoration in agriculture. These joint efforts of scientists from different disciplines can find the correct explanation to difficult processes in reproduction of soil fertility, to which leads to business enterprises. Thus, the use of an interdisciplinary approach in agroeconomical research will contribute producing promising concep-

tual ideas for solving scientific problems of rational use of soil resources and soil fertility reproduction.

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THE PROBLEMS OF AUDIT OF FIXED ASSETS IN RUSSIA

Аннотация: В статье раскрываются проблемы аудита основных средств, а также перспективы его развития в России. Особое внимание в данной статье уделяется автоматизации аудита и преимущества его использования организациями.

Ключевые слова: основные средства, аудит, компьютерные технологии, автоматизация, интернет.

In Russia, the fixed assets are faced with some problems, namely the low competitiveness of products, which is connected with the moral and physical deterioration of the equipment, inflated taxes, as well as the lack of a realistic assessment of the assets.

It should be noted that in recent years increased influence of fixed assets on the quality of the subjects of management reporting and financial condition. We can assume that today for many organizations, plant and equipment has become very significant object of the audit.

In Asset Accounting, there are common mistakes: improper documentation of operations for the adoption of fixed assets; transfer property, plant and equipment only after the state registration; improper copying an item of property, which consists of several parts; improper accounting of costs for the modernization of fixed assets and other errors.

If you want to check operations with fixed assets was more effective, you need to constantly evaluate the internal control system.

Timely evaluation of ICS allows for a more qualitative form the conclusions of the auditor in the auditor's report management entity.

Over the past decade, significantly increased demands on the organization of accounting and reporting systems. Therefore, new methods and forms of accounting, including the use of computer systems.

The introductions of modern computer technology not only makes it easier to work counting employees and reduces the time of reporting, but also improves the quality of accounting calculations through the use of more efficient methods of inclusion in the cost of certain costs and improve the accuracy of their compilation, available in manual labor accountants.

In the transition to enterprise computerized data processing should take into account the impact of automation on the construction of the system of accounting and business management:

1. The centralization of records and decentralization of processing. Automation of a large part of primary documents, records and reports.

2. The reduction in the risk of errors in the accounts, by reducing the share of routine manual operations and increase the input sequence and processing.

3. The increase in the risk of errors in the accounts in connection with unauthorized access to a database or a crash.

4. The shortening reporting information until permanent.

5. The growth of analytic credentials, their representativeness for the control system.

6. The increase in requirements for qualification of personnel.

7. The possibility of parallel accounting systems and multiple accounts on multiple standards.

The Internet is a very good helper in any job.. During the recording of transactions with fixed assets in accounting disputes occur, a number of questions. Quickly respond to your questions and solve the problem will allow the Internet. It is therefore necessary to provide access Accountant, plant and equipment to the global network.

In addition, it is necessary to introduce analysis of the effectiveness of fixed assets, according to the accounting under the direct supervision of the director. In this case, the manager will get a more complete picture of the state of affairs in the company.

Also, it should be noted that the efficiency increases with the use of audit auditors specialized software. Time of the audit, as compared with the more antiquated methods reduced. In this regard, increasing the list of audit-related services and increase customer satisfaction.

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COMPETITIVE ENVIRONMENT ASSESSMENT OF MILK PRODUCTION ON THE EXAMPLE OF "FARMING COMPANY PODGORNOE" ROSSOSH DISTRICT OF VORONEZH REGION

Аннотация: В данной статье рассматривается один из методов анализа конкурентной среды, базирующийся на составлении качественной таблицы, которая наглядно отражает сильные и слабые стороны ООО «Агрофирма Подгорное» Россошанского района Воронежской области по сравнению с конкурентами.

Ключевые слова: Экономика, конкуренция, конкурентная среда, Россошанский район, оценка конкурентов.

The production of goods in conditions of high competition isn't a new phenomenon nowadays. Long time ago leaders understood, if they wanted to lead a successful and effective company, they needed to win the competition. And they need to conquest the largest market share, to get the highest efficiency, to have the greatest number of consumers. It will be true, if they develop a strategy of competitive fight. And leaders will get all advantages, relative to their competitors.

Any company should constantly monitor and analyze the competitive advantages in the market where this company and the competing firms offer similar goods and services on a consumer demand for having priorities and effective strategies, corresponding to tendencies of the market situation development and basing on company strengths [3].

The analysis method of the competitive environment of the milk produced in LLC "Agrofirma Podgornoe" Rossosh district of Voronezh region will be considered in the article.

Competitors - are companies working in the same market and providing similar products to one group of consumers.

Commodity is competitive when the complex of consumer and monetary properties provides it a commercial success [2].

All methods of research competitors can be classified into:

1) Direct and indirect. Direct methods aimed at getting necessary information from the annual reports of the rival enterprises published in mass media. Indirect methods aimed at getting useful data from other sources. Today indirect methods dominate over indirect methods, because they are more available;

2) External supervision and penetration. External supervision is carried out without any contact with employees of a company-competitor, at a distance. The name "Penetration" speaks for itself, there are various surveys of employees, any dialogue, for example,

under the guise of the buyer. It is better to make penetration by outside services, but not their own staff.

3) Qualitative and quantitative. Qualitative researchers provide initial information about the object. Quantitative researches give quantitative information and final decisions are made on its basis.

There are also so-called mixed methods. They evaluate competitors using different indicators at the same time. Evaluation of competitors can be carried out in the following parameters:

1. The reputation and image of the company, products quality
2. A variety of produced products, the level of business diversification
3. Performance indicators (profitability)
4. The market share of the enterprise products
5. Corporate finance (equity and debt)
6. The price of the products making the highest profit from the sale; prime cost of this product.
7. Evaluation of personnel, equipment, and energy potential of the enterprise
8. Quality and budget of market researchers.

This list should be reduced or expanded, based on the sphere of company activities, the industry and product features.

According to the results of received competitive information collected on the basis of the above-mentioned criteria, the table where for each criterion points are set and the place of the company in the competitive environment is determined. There is a ranking of competitors.

Table 1 presents a qualitative assessment of two competitors in LLC "Farming Company Podgornoe".

Table 1. Comparative evaluation of enterprises, Rossosh district of Voronezh region

Data	OJSC "Southern"		LLC "Farming Company Podgornoe "		Agricultural artel "Dawn"	
	Value	Numb er of points	Value	Nu mb er of poi nts	Value	Num ber of point s
The price of milk, RUB/kg	1426,3 2	5	1253,5 6	3	1228,3 7	1
The cost of milk, RUB/kg	1048,5 2	3	1047,5 2	5	1498,9 0	1
The market share of milk, %	11,78	5	1,85	3	0,73	1
Rate of return, %	136,0	5	119,7	3	22,0	1
Utilization factor of own current assets	-0,08	5	-1,08	1	-1,02	3
Quantity of points	23		15		7	
Our strengths	Below prime cost					
			Below prime cost , market share, rate of return, utilization factor of own current assets and price are higher			
Our weaknesses	Price, market share, rate of return and utilization factor of own current assets are lower					
			LLC "Farming Company Podgornoe has borrowed more money than its competitor			
The situation on the milk market	Leading		Following the leader		Lagging	

The obtained data which are presented in table 1, helped to evaluate competitors on various parameters. The evaluation showed that the leader is OJSC "South". This company has the greatest number of advantages in the competitive environment. The weakest, according to the evaluation criteria of these three enterprises was the agricultural artel "Dawn". The geographical position is the same, therefore, climat-

ic features are similar, and all these three enterprises work at the expense of borrowed funds.

The company LLC «Agrofirma Podgornoe» needs to change the functioning strategy to take a leading position. Knowing strengths and weaknesses in comparison with its competitors, the company should increase market share by increasing the production volume, which is achieved by increasing the productivity of cows, their species, housing condition and quality of food supply. The increase in profit is possible by increasing the number of marketable milk, so there is an opportunity to reduce leverage ratio starting to use its own sources. Despite the fact that in “prime cost” parameter economy wins, the gap is very low, so you also need to find ways to reduce prime costs by increasing productivity and reducing prime costs.

It is clear that all measures aimed at improving positions in a competitive rental environment are interrelated and one follows from the other. It proves once again that "Farming company Podgornoe" should reconsider its strategy, to choose the one which would consider all the weaknesses of the enterprise.

Today, the government supports actively the agricultural producers, offering them various grants and subsidies. This should be taken into account at changing company strategy. Each enterprise, using this method of the mixed assessment of the competitive environment has to specify parameters in which there is an assessment from the desirable result. And, according to the idea of the end result, each enterprise should make the table in which the assessment of competitors will be made. The system of points can also change but one thing remains unchanged, that this method of assessment reflects visually the strengths and weaknesses of the enterprise.

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AKTUELLE ENTWICKLUNG DER LANDWIRTSCHAFT UND DES LANDTECHNIKMARKTES IN RUSSLAND

Аннотация: В рамках этой статьи был проведен анализ политической и экономической ситуации в Российской Федерации. Кроме того, проанализировано актуальное развитие сельского хозяйства и рынка сельхозтехники в России. В этой статье даны ответы на следующие вопросы: „Какие регионы России играют решающую роль для сельского хозяйства?“ и „Как развивается сельское хозяйство в России?“.

Ключевые слова: стратегический маркетинг, стратегическое планирование, маркетинговый анализ, сельское хозяйство.

Gerade in Zeiten knapper Ressourcen, einer sich schnell entwickelnden Wirtschaft und einem verstärkten Wettbewerb werden hohe Ansprüche an die Geschäftstätigkeit und Handelsinitiative von Betriebsleitern gesetzt. Darüber hinaus besteht das Problem der Überbevölkerung der Erde: Im Jahr 2050 wird die Weltbevölkerung von 7,16 Milliarden auf 9,5 Milliarden Menschen anwachsen. [1] Diese wachsende Weltbevölkerung braucht immer mehr Nahrungsmittel. Um diesen Bedarfsanstieg zu decken, muss die Produktion landwirtschaftlicher Rohstoffe erhöht werden. Aus diesem Grund spielt Marketing eine wichtige Rolle in der Landwirtschaft und Landtechnikvermarktung.

Das Konzept des Marketings besagt, dass ein Unternehmen, das erfolgreich sein will, sollte die Wünsche und Bedürfnisse der Kunden besser als die Konkurrenz decken. [2] Ziel jedes Unternehmens ist der Absatz der von ihm erstellten Leistungen, die materieller (Produkte),

aber auch immaterieller Art (Dienstleistungen) sein können. [3] Definition des Produkts ist folgendes: „Ein Produkt ist jedes Objekt, das auf einem Markt zur Beachtung oder Wahl, zum Kauf, zur Benutzung oder zum Verbrauch angeboten wird und geeignet ist, um Wünsche oder Bedürfnisse zu befriedigen“ [4] Das richtige Produkt auf den Markt zu bringen, ist daher für den Erfolg des Unternehmens eine Voraussetzung. Damit ist es nicht so sehr physische Substanz des Produktes gemeint, sondern vielmehr der Nutzen, den das Produkt vermitteln kann. [5]

“Marketing ist eine systematische Planung und Ausgestaltung aller auf die Erschließung und Pflege von Märkten ausgerichteten Unternehmensaktivitäten zur Befriedigung der Kundenwünsche einerseits und zur Verwirklichung der Unternehmensziele andererseits.” [6]

Dasselbe gilt für Business-to-Business-Marketing. Der Markt für Landtechnik ist in der Regel ein B-to-B-Markt. Die Nachfrage nach Landtechnik ist eine abgeleitete Nachfrage – sie hängt in der letzte Instanz von der Nachfrage nach Konsumgütern ab, z.B. je mehr Milch verbraucht wird, desto mehr Grünlandmaschinen man braucht, um das Grundfutter vorzubereiten. In dem Landtechnikmarkt besteht eine unelastische Nachfrage. Das bedeutet, dass die Nachfrage, zumindest, kurzfristig, nicht oder nur sehr wenig auf Preisänderungen reagiert. [6] Selbstverständlich hat das Marketing der Landmaschinen eigene Besonderheiten: Langfristig gesehen, haben Landmaschinen, als Waren, wegen ständiger Alterung der Technik und schnelleren technischen Fortschritts eine konstante Nachfrage in der Welt, was ihre Liquidität beweist.

Dieser Artikel basiert auf unserer Masterarbeit zum Thema „Wachstumspotentiale der Firma Alois PÖTTINGER Maschinenfabrik GmbH auf dem russischen Markt“. Dieser Hersteller gehört zu den weltweit führenden Produzenten von Anbau-, Aufbau- und gezogenen Geräten zur Bodenbearbeitung, Aussaat und Erntetechnik. Im Rahmen dieser Arbeit wurde eine Situationsanalyse in Russland durchgeführt und hat die wirtschaftliche, politische Lage, sowie Entwicklung der russischen Landwirtschaft und Landtechnikproduktion berücksichtigt.

In der Arbeit wurden ca. 300 russische Händler im Bereich Agrartechnik anhand verschiedener Kriterien analysiert mit dem Ziel möglichst gute Vertriebspartner für die Firma PÖTTINGER zu finden. Landtechnik ist in der Regel B-to-B-Markt: Viele Hersteller verkaufen

nicht an Endkunden, sondern an andere Unternehmen. Anbieter von Landtechnik haben es mit wenigen Kunden, aber mit viel größeren Absatzvolumina pro Kunde zu tun. Als Kunden dienen Händler, die Landmaschinen an Endkunden verkaufen. Heutzutage ist die Konkurrenz auf diesem Markt sehr hoch. In gegebener Situation ist es kompliziert, einen zuverlässigen Partner zu finden, der sowohl von dem technischen, als auch von dem wirtschaftlichen Gesichtspunkt aus gewinnreich wäre.

Die Analyse des russischen Händlernetzwerkes hat gezeigt, dass die vier Regionen (Wolga, Sibirien, Zentralrussland und Südrussland) bei der Vermarktung der Landtechnik entscheidend sind. Genauso hat die Analyse der russischen Landwirtschaft gezeigt, dass Föderationskreise Wolga, Sibirien, Zentralrussland und Südrussland bei der Vermarktung der Landtechnik in Russland eine der wichtigsten Rollen spielen. Sie erzeugen ca. 75% Agrargüter Russlands.

Aus der Untersuchung von Föderationskreisen kann das Fazit gezogen werden, dass sie verschiedenes Entwicklungsniveau haben, was die Klimabedingungen verursachen. Besonders starke Föderationskreise in der Landwirtschaft sind Zentral- und Südrussland.

Die russische Landwirtschaft steht ganz oben auf der Prioritätenliste der Regierung Russlands. Dies ist nicht erst seit dem Lebensmittelembargo vom 6. August 2014. Der Landwirtschaftssektor trägt 3,2 Prozent zum russischen Bruttoinlandsprodukt bei und ist eine der dynamischsten Branchen in Russland. Die Regierung misst der Pflanzen- und Tierzucht große Bedeutung bei. Der Staat lässt sich das einiges kosten: Subventionen von rund 300 Milliarden Rubel (ca. 4,7 Milliarden Euro; 31. März 2015: 1 Euro = 63,36 Rubel) pro Jahr bis 2020. [9] Sollten sich die Preise für Öl und Gas im Laufe des Jahres verbessern, würden auch die Subventionen der Landwirtschaft, sowie Kaufkraft der Landwirte, noch größer, weil das Export von diesen Rohstoffen einen großen Anteil an dem Einkommen Russlands hat: Je höher die Rohstoffpreise sind, desto höher sind Subventionen der Landwirte.

Die Entwicklung des Agro-Industriekomplexes wurde von der Regierung Russlands am 14. Juli 2012 laut Verordnung № 717 zur Nationalen Priorität erklärt. Das Projekt des Landwirtschaftsministeriums erhält 6 Schwerpunkte:

Erhöhung der Produktion von wichtigen landwirtschaftlichen Erzeugnissen, die in der Ernährungssicherheitsdoktrin für die Russischen Föderation genannt sind:

- Erhöhung der Fischproduktion
- Verbesserung der Lebensqualität im ländlichen Raum
- Förderung der Klein- und Mittelbetriebe
- Reproduktion und eine effizientere Nutzung der landwirtschaftlichen Flächen
- Sicherung der Tierseuchensituation in Russland

Die Ernährungssicherheitsdoktrin für Russland ist eine der obersten Prioritäten der Nationalen Sicherheitsstrategie bis zum Jahr 2020 (Verordnung der Präsidenten Nr. 537 vom 12. Mai 2009).

Da Russland ein wichtiges Importland ist, haben die ausländischen Produkte auch einen Einfluss auf russische Landwirtschaft durch die Weltmarktpreise für Agrargüter. Um die Stabilität des Landes zu gewähren, hat der damalige russische Präsident D. A. Medwedew am 30. Januar 2010 die Verordnung Nr. 120 «Über die Verabschiedung der Doktrin zur Lebensmittelsicherheit der Russischen Föderation» unterschrieben. Die Verordnung des Präsidenten bestimmt die Strategie des Landes bezogen auf die Lebensmittelsicherheit. Der Präsident stellt die Lebensmittelsicherheit in direkten Zusammenhang mit der sozialen Stabilität des Landes. Die Entwicklung der ländlichen Räume und die Erhöhung des Wohlstandes der Bürger sind daher die wichtigsten Ziele der Doktrin. Auf diese Weise soll der Getreide- und der Kartoffelanteil aus heimischer Produktion 95%, der Anteil an Fleisch und Fleischerzeugnissen (umgerechnet auf den Fleischanteil) 85 %, der Anteil an Milch und Milchprodukten (umgerechnet auf den Milchanteil) 90%, der Anteil an Zucker 80%, der Anteil an Pflanzenöl 80%, der Anteil an Fisch und Fischproduktion mindestens 80% betragen. [10]

Auf Basis dieser Ernährungssicherheitsdoktrin und der staatlichen Statistik wurde folgende Tabelle erstellt:

Tabelle 1: Selbstversorgung in Russland, %

Agrargüter	Selbstversorgung 2008	Selbstversorgung 2013	Selbstversorgung nach Ernährungssicherheitsdoktr in
Getreide	99,0%	98,4%	95,0%
Kartoffeln	99,0%	97,5%	95,0%
Milch	78,0%	76,6%	90,0%
Fleisch	61,0%	77,5%	85,0%
Fisch		78,2%	80,0%
Zucker	56,0%	92,9%	80,0%
Pflanzenöl	65,0%	81,1%	80,0%

Quelle: Eigene Darstellung nach (de.agrardialog.ru 2014) und (Bundesministeriums für Ernährung, Landwirtschaft und Verbraucherschutz (Deutschland) 2010)

Im Jahr 2013 betrug die Selbstversorgung bei Milch und Fleisch in Russland weniger als 80% (unter der Ernährungssicherheitsschwelle), beim Getreide – 98,4% (3,4% über der Schwelle), Kartoffeln – 97,5% (2,5% über der Schwelle). Beim Fisch wurde die Schwelle auch nicht erreicht, aber bei Zucker und Pflanzenöl sehen wir Kennzahlen, die das Ziel überschreiten erfüllen. Die Selbstversorgung bei letzten zwei Agrargütern hat sich innerhalb von 5 Jahren deutlich verbessert. Dafür haben nationale Projekte einen großen Beitrag zur Entwicklung der Landwirtschaft geleistet.

Bezüglich der aktuellen Situation beim Import von Agrargütern in Russland: Als Reaktion auf die Wirtschaftssanktionen des Westens hat Russland am 6. August 2014 für ein Jahr ein Importverbot für einige Agrarprodukte aus der EU, den USA, Kanada, Australien und Norwegen verhängt. Davon betroffen sind Fleisch, Milch, Obst, Gemüse, Nüsse und Fisch. [11]

Schließlich sei betont, dass Russland einen großen Einfluss auf die Weltmarktpreise durch sein Angebot und seine Nachfrage heutzutage hat, da Russland viertgrößter Exporteur für Getreide weltweit bis Februar 2015 war (ca. 11% der Weltexportmenge) und bedeutendster Importeur in allen Fleischarten ist. [12]

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RISK ANALYSIS OF ECONOMIC ACTIVITY IN THE AUDIT CONTINUITY OF COMMERCIAL ORGANIZATIONS.

Аннотация: Принцип непрерывности деятельности, финансовые и производственные признаки, риски хозяйственной деятельности, оценка рисков, вероятность достоверной оценки допущения непрерывности деятельности.

Ключевые слова: риски, хозяйственная деятельность, оценка и аудит.

The audit, as a form of financial control is aimed to verify the reliability of the accounting (financial) statements, the main principle in the preparation of which is the assumption of continuity. In accordance with the principle of assumptions of continuity it is usually meant that the audited entity will continue to carry out its financial and economic activity within 12 months of the year following the reporting year and has no intention or need to liquidate, terminate financial activities or seek protection from creditors [2]. Therefore, in the process of the audit the auditor should verify if the audited entity follows the principle of continuity and is able to continue its activity in the foreseeable future.

The Federal rule (standard) of auditor activity No. 11 "the Applicability of the assumption of the continuity of the audited entity" approved by RF Government Decree dated 04.07.2003, No. 405 provides a list of features according to which the auditor may have doubts as to the applicability of the assumptions of continuity. These include financial, operational and other features. The analysis of their composition and content shows that all of these features are due to risks of economic activities of commercial organizations (business risks): falling demand for manufactured products, loss of markets,

lack of means of production or increase of their value, significant changes in the legislation regulating the activities of the entity (for example, increasing tax rates, credit rates), changes in the political and economic situation in the country. Business risk may also arise due to changes or difficulties in economic activity and inability of management to identify and assess possible changes and respond to them. The following circumstances, such as change in the nature or level of operations, introduction of new technologies, changes in the management system, modernization of the information system, changes in normative acts on business law and accounting may lead to the emergence of business risks.

In order to make reasonable conclusions about the ability of the audited entity to continue its activity the auditor should study and evaluate the inherent risks of its economic activity.

The auditor evaluates whether it can rely on the effectiveness of control used by the client. Depending on this further audit procedures and conclusions are determined.

The General approach to the study and assessment of economic risks that affect the ability of the audited entity to continue its activity may be represented by the following stages:

- 1) the study and evaluation of the activity of the audited entity, the environment in which it is performed, its goals, strategies, and identification of inherent business risks;

- 2) assessment of the significance of risks and their impact on the ability of the audited entity to continue its activity;

- 3) evaluation of management action to identify business risks, understand their significance and confront them;

- 4) inspection of the effectiveness of the internal control system of the audited entity, its ability to prevent, identify and annihilate business risks;

- 5) identification of the further audit procedures in case of detection of risks and factors that contribute to considerable doubt about the ability of the audited entity to continue its activity. These include:

- checking plans of the audited organization in regard to future activities on the basis of its evaluation of the assumptions of continuity;
- auditing procedures for collecting reliable audit evidence to confirm or refute the presence of significant factors of uncertainty;
- requesting the administration of the audited entity to submit written information concerning their plans for the future;

6) formulating conclusions about following the principle of the assumptions of continuity in the auditor's conclusion;

Audit procedures aimed at identifying business risks and assessment of the principle of the assumptions of continuity must be performed throughout auditing, during the processes of planning the audit and gathering audit evidence.

The auditor understanding of economic risks of the client increases the likelihood of a reliable assessment of the assumptions of continuity.

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ECONOMICAL AND STATISTICAL ANALYSIS OF SUNFLOWER PRODUCTION EFFECTIVENESS IN THE AG- RICULTURAL ENTERPRISES OF VORONEZH REGION

Аннотация: Данная статья посвящена определению резервов увеличения выручки и рентабельности производства подсолнечника на основе статистико-экономического факторного анализа. По результатам исследования предложены мероприятия по повышению эффективности производства подсолнечника в сельскохозяйственных предприятиях Воронежской области.

Ключевые слова: статистико-экономический факторный анализ; эффективность; резервы увеличения выручки и рентабельности производства подсолнечника; сельскохозяйственное предприятие; Воронежская область.

Sunflower is one of the most important crops for the agricultural enterprises of Voronezh region as it provides significantly higher rate of profitability comparing to other crops grown in the area. [4, 5] According to the data of Ministry of Agriculture of the Russian Federation sunflower occupied 7,271 thousand hectares in 2013. That was 742 thousand hectares (11.4%) more than in 2012. [2] The total yield of sunflower was 10.6 million tons in 2013. That was 2.6 million tons (32.5%) more than in 2012. [2]

These are the good results especially if we compare them to the strategy determined in the State Programme of agricultural development and regulating of markets of agricultural goods, raw materials and provisions for 2013-2020. [1]

Nevertheless the economical situation has dramatically changed since this programme was established. In the circumstances of economical sanctions that the EU countries and the USA have implemented against Russia new production risks have arisen. The growth

of prices for the imported machinery, seeds, fertilizers and pesticides, high rate of credit interests produce new threats to the sunflower production effectiveness.

Therefore we tried to find out if there are any possibilities of efficiency growth (or its stabilization) in the severe conditions of strictly limited resources. The idea was to determine the most important internal factors to make the cost of sunflower production lower, to keep high quality of the seeds, to raise cash flow and profitability of production in the agricultural enterprises of Voronezh region.

Our research was based on the data of agricultural enterprises of Anna, Kalach, Pavlovsk, Vorobiovka, Khohol and Semiluky districts of Voronezh region. The representativeness of the sample was provided by the total number of observations which was 120 agricultural enterprises specializing in sunflower production. The research was based on the procedures of time series analysis (the period from 2000 to 2013 was estimated), index analysis, cluster analysis, correlation, regression and dispersion analysis.

The final regression model of sunflower profitability level was obtained by using the procedures of step-by-step regression analysis. These procedures helped us eliminate statistically insignificant factors that didn't influence the dependent variable (profitability level) at the significance level 95%.

Table 1 - The regression model of sunflower profitability level

Variables	Regression coefficient	Standard error	t-statistics	Significance level
Constant	279.199	51.096	5.464	0.000
1.Intensiveness level (cost per hectare), rub. (x3)	-0.005	0.001	-3.572	0.002
2. Yield per hectare, centner (x5)	1.045	0.403	2.590	0.017
3. Market price per centner, rub. (x8)	0.151	0.033	4.605	0.000

R- SE = MAE = DW =
 SQ.(ADJ.)=0.684 19.084 14.912 2.044

As the model shown in table 1 is statistically significant we were able to estimate the potential sunflower production efficiency growth.

Table 2 - The potential sunflower production efficiency growth

Variables	Average level of factors			Deviation of the least developed enterprises		Regression coefficient	Potential efficiency growth, %	
	in the sample	among the most developed enterprises	among the least developed enterprises	from the mean enterprises	from the most developed enterprises		to the mean level	to the level of the most developed enterprises
1. Intensiveness level (cost per hectare), rub. (x3)	11451	9173	15501	-4050	-6328	-0,005	20.25	31.64
2. Yield per hectare, centner (x5)	15.5	19.4	11.3	4.2	8.1	1.045	4.39	8.46
3. Market price per centner, rub. (x8)	1034.56	1223.,2 9	794.36	240.2	428.93	0.151	36.27	64.77
Total	X	X	X	X	X	X	60.91	104.8 7

The calculations of table 2 shows that if the least developed enterprises raise all the factors to the average sample level, the potential efficiency growth will be 60.91%. If the least developed enterprises raise all the factors to the level of most developed enterprises, the potential efficiency growth will be 104.87%.

The analysis of residuals helped us to choose the enterprises where cash flow can be increased according to the regression model.

Table 3 – Potential cash flow growth in the enterprises of the sample

Agricultural enterprises	Cost of sunflower production, thousand rubles (f)	Observed profitability level, % (y_0)	Estimated profitability level, % (y_1)	Residuals, % ($y_1 - y_0$)	Cash flow growth, thousand rubles ($(y_1 - y_0) * f$)
1	2	3	4	5	6
Vektor	4310	116.38	126.12	9.74	419.79
Agroshans	2941	11.70	140.01	128.31	3773.60
Novaya Kriusha	10784	34.30	63.58	29.28	3154.29
Hleborob	2508	97.21	101.03	3.82	95.81
Agro-Niva	1467	76.20	95.82	19.62	287.87
Slavyansky	3182	116.88	117.20	0,31	9.86
Bavaria	6191	44.30	67.36	23.06	1427.52
Karachevskoye	850	164.47	177.17	12.70	107.95

Table 3 continuation

1	2	3	4	5	6
Rassvet	1126	101.87	108.23	6.36	71.61
Hleborodnoye	12167	120.00	129.08	9.08	1104.81
Nizhnekislyanskaya	3483	136.86	163.04	26.18	911.85
Podgornoye	9236	103.00	138.85	35.85	3310.82
Krasnologskaya	984	100.91	111.66	10.75	105.78
Nashcheykino	5437	88.10	102.73	14.63	795.34
Agrotehgarant	2004	156.99	157.91	0.92	18.44
Bolshevik	6858	68.60	87.80	19.20	1316.46
Niva	473	162.16	228.28	66.12	312.75
Yasirky	1171	166.52	236.52	70.00	819.70
Rubashevsky	3135	56.60	72.23	15.63	489.99
Druzhba	3799	166.10	183.04	16.94	643.55
Manino	7953	85.80	106.28	20.48	1628.41
ATG	7313	102.90	111.83	8.93	653.34
Novonadezhdinskaya	828	107.73	221.43	113.70	941.44
Pugachyovsky	7406	71.20	81.20	10.00	740.68
Levashevka	1620	122.35	151.81	29.46	477.25
Granat	12425	39.60	46.35	6.75	838.73
Vorobiovskoye	6174	108.28	121.89	13.61	840.28
Kuybisheva	8268	73.30	79.51	6.21	513.18
Myr	2809	177.93	208.55	30.62	860.12
Zarya	3817	54.90	55.32	0.42	16.10
Total	X	X	X	X	31285.79

Therefore more effective production of sunflower in the agricultural enterprises of the sample can cause the potential cash flow growth of 31,285.79 thousand rubles.

To achieve the goals of sunflower production profitability growth in the agricultural enterprises of Voronezh region we can propose some ways:

- further development of the production structure and specialization of enterprises;
- optimization of sunflower sort structure and sort combinations;
- realization of intensive technologies and saving natural land productivity by using correct crop rotation;
- optimization of production resources by correction of mineral and organic fertilizers dosage, more effective machinery management, land melioration, anti-erosion activities, seed-growing improvement;
- everyday strict control of the production costs;
- complex mechanization of working process, following agro technical recommendations about the time and duration of field work especially harvesting.

In conclusion we would like to say that economical growth is obviously founded on low cost production, effective management and strategically wise marketing. All these measures will help to increase sunflower production efficiency and support agrarian welfare in Voronezh region.

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THE REASONS OF INEFFECTIVE BUDGETING AT ENTERPRISES OF AGROINDUSTRIAL COMPLEX

Аннотация: Кризис заставил многие предприятия скорректировать используемые системы и процедуры планирования и бюджетирования. В статье сделана попытка выявить основные причины неэффективного бюджетирования, основные принципы построения системы, а также определить возможные результаты системы бюджетирования «снизу вверх».

Ключевые слова: бюджет, контроллинг, система бюджетирования, управление предприятием.

In modern conditions budgeting is one of the key controls of operation business. A vast majority of companies have not only realized the necessity of planning the financial recourses, but have also imple-

mented such planning. The effect that budgeting enables to reach is the following: controlling the totals of a particular period, and also defining the reasons of deviations, which gives an opportunity to model financial sequences and effects of management decisions that have been made. However, when budgeting system is implemented at an enterprise, some problems that don't allow realizing its advantages can arise.

Due to this the most important task is to identify the problems of budgeting, their location and possible ways of improving the budgeting system that has been implemented.

At the first stage it is necessary to identify the reasons of ineffective budgeting. Reading economics literature [1,2] such reasons can be found:

1. Using the budgeting system that has been implemented only as a financial technique; in other words, companies use budgets to control the actual cash assets turnover, not to make management decisions;
2. Projects and reports are overloaded with unnecessary extra information;
3. Budgets give only a sketchy image about company's activities;
4. Budgeting process is built up ineffectively;
5. Managerial staff doesn't want to use budgeting.

A vast majority of companies and financial managers in particular are able to solve most of these problems. Using the budgeting system correctly should result in getting a work tool that allows to solve effectively the problems of financial administration, planning and controlling company's activities, and also to create a stable basis for making management decisions.

The budgeting system "bottom up" is a system where the parameters of production plans are estimated in money. Operating budgets of business divisions are formed out of these parameters. These operating budgets are used later to make up the block of financial budgets (budgetary balance, income and expense budget, cash flow budget).

To build such a management system, the budgeting system that is used should have a few additional features [2]:

1. It is necessary to confirm the responsibility of the executive who manages the budgeting funds (somebody who is in charge of a particular center, it can be a manager of a department, a function director, a project manager). The means that help to confirm the responsibility are:

- Planning data in real form and in form of money;
- KPI system;
- Motivation system linked to KPI.

2. The possibility to transfer the rights of using the budget. To do that we can use the mechanisms which:

- Give the budget keeper a possibility to manage the allocated funds;
- Clarify the system of paying budget submissions (make it possible to forecast and control due dates of payment in terms of budget);
- Fix the budget limit of budget items.

We believe that using the budgeting system that has the features mentioned above it is possible to reach the results important for operation of business:

1. Higher management relieve themselves from performing a lot of functions (these functions are delegated to lower management levels);

2. The decisions (in terms of functions that were delegated to lower management) are made more time efficiently;

3. The decisions are of high quality due to the fact that they are made by competent people in operating units.

Due to the research that has been carried out we have identified and analyzed the main reasons of ineffective budgeting, that any financial manager can cope with. Nowadays the most acute problem of budgeting is the fact that budgets have become just ceremonial functions. It is necessary to remember that it is extremely important not just to implement the budgeting system but also to realize that it is a

powerful financial tool for operation of business that will lead the enterprise to reaching strategic aims in shortest time.

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LE NOUVEAU REGLEMENT SUR LE DEVELOPPEMENT RURAL DE L'UNION EUROPEENNE 2007-2013

Аннотация: В данной статье проводится обзор новой европейской сельскохозяйственной политики.

Ключевые слова: Европейский союз, сельское хозяйство, законодательство.

Étant donné que plus de la moitié de la population des vingt-cinq États membres de l'Union européenne (UE) vit dans les zones rurales, qui représentent 90 % du territoire, le développement rural constitue un domaine politique extrêmement important. L'agriculture et la sylviculture restent fondamentales pour l'utilisation des terres et la gestion des ressources naturelles dans les zones rurales de l'UE, et comme plate-forme pour la diversification économique dans les communautés rurales.

Le renforcement de la politique de développement rural de l'UE est devenu une priorité générale de l'UE. Ce point a d'ailleurs été clarifié de la manière suivante dans les conclusions du Conseil européen de Göteborg en juin 2001: «Au cours des dernières années,

la politique agricole européenne a accordé moins d'importance aux mécanismes des marchés et, par des aides ciblées, a visé davantage à satisfaire les demandes croissantes du grand public concernant la sécurité alimentaire, la qualité des denrées alimentaires, la différenciation des produits, le bien-être des animaux, la qualité de l'environnement et la conservation de la nature et de la campagne».

À la suite de la réforme fondamentale du premier pilier¹ de la Politique agricole commune (PAC) en 2003 et 2004, le Conseil «Agriculture» a adopté en septembre 2005 une réforme radicale de la politique de développement rural pour la période 2007-2013² fondée sur la proposition de la Commission du 14 juillet 2004³.

Dans le droit fil des conclusions de la Conférence de Salzbourg sur le développement rural (novembre 2003) et des orientations des Conseils européens de Lisbonne et Göteborg soulignant les éléments économiques, sociaux et environnementaux de la durabilité, les trois objectifs principaux suivants de la politique de développement rural ont été fixés pour la période 2007-2013:

- renforcer la compétitivité du secteur agricole,
- améliorer l'environnement et l'espace rural par le soutien à la gestion des terres,
- améliorer la qualité de la vie dans les zones rurales et promouvoir la diversification des activités économiques.

De plus, la réforme intègre l'initiative communautaire Leader dans la programmation générale du développement rural et constitue une étape importante dans le processus de simplification en prévoyant un cadre unique de financement et de programmation.

La nouvelle politique de développement rural de l'UE, telle qu'elle est décrite dans le règlement (CE) n° 1698/2005, est caractérisée par «le changement dans la continuité». La continuité tout d'abord, car elle maintient à la disposition des États membres un ensemble de mesures pour lesquelles la Communauté apporte son concours financier dans le cadre de programmes de développement rural intégrés. Le changement ensuite, car elle modifie la manière dont ces programmes sont élaborés, l'accent étant désormais placé sur le contenu stratégique et sur le développement durable des zones rurales. À cet effet, la politique de développement rural actuelle met l'accent sur trois objectifs politiques principaux, définis d'un commun accord:

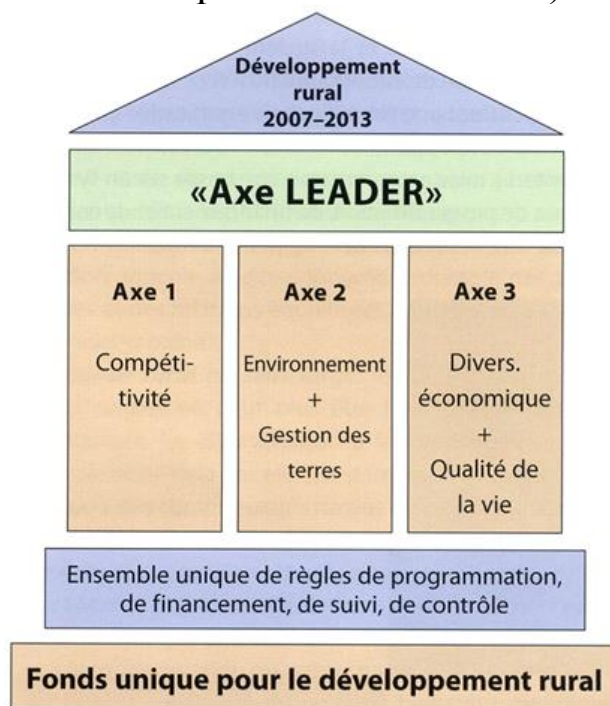
- améliorer la compétitivité des secteurs agricole et sylvicole;

- fournir un soutien à la gestion des terres et améliorer l'environnement, et

- améliorer la qualité de la vie et encourager la diversification des activités économiques.

Un axe thématique correspond à chacun des objectifs principaux dans les programmes de développement rural. Ces trois axes thématiques sont complétés par un axe «méthodologique» consacré à l'approche Leader (axe Leader). Un financement minimal pour chaque axe est nécessaire afin de garantir un équilibre global dans le programme (10 % pour l'axe 1, 25 % pour l'axe 2, 10 % pour l'axe 3 et 5 % pour l'axe Leader - qui est de 2,5 % dans les nouveaux États membres). Il existe une série de mesures de développement rural prédéfinies, qui constituent les principaux éléments des axes thématiques (voir tableau 1), parmi lesquelles les États membres peuvent choisir celles qui, d'après eux, créeront la plus haute valeur ajoutée, compte tenu des objectifs de l'UE.

Cette approche permet à l'UE de concentrer son cofinancement pour le développement rural sur les priorités communautaires convenues en commun pour les trois axes politiques, tout en laissant suffisamment de flexibilité à l'État membre et au niveau régional pour trouver un équilibre entre la dimension sectorielle (restructuration agricole) et la dimension territoriale (gestion des terres et développement socio-économique des zones rurales).



Le nouveau règlement constitue un progrès en ce qui concerne tant le contenu de la politique que sa mise en oeuvre. Les différentes règles en matière de programmation, de financement, de notification et de contrôle (du Fonds européen d'orientation et de garantie agricole, FEOGA) de la période de programmation 2000-2006 ont considérablement alourdi la tâche administrative qui incombe aux États membres et à la Commission et a réduit la cohérence, la transparence et la visibilité de la politique de développement rural. L'existence d'un seul Fonds, le Fonds européen agricole pour le développement rural (Feader), et d'un seul ensemble de règles de programmation, de financement, d'information et de contrôle simplifie considérablement l'exécution de la politique.

Orientations stratégiques communautaires

1. Amélioration de la compétitivité des secteurs agricole et forestier. Les ressources allouées à l'axe 1 doivent contribuer à renforcer et à dynamiser le secteur agroalimentaire européen en se concentrant sur les priorités du transfert de connaissances, de la modernisation, de l'innovation et de la qualité dans la chaîne alimentaire et sur les secteurs prioritaires pour l'investissement dans le capital physique et humain.

2. Amélioration de l'environnement et du paysage. Afin de protéger et d'améliorer les ressources naturelles et les paysages des zones rurales de l'UE, les ressources allouées à l'axe 2 devraient contribuer à trois domaines prioritaires au niveau de l'UE: biodiversité, préservation et développement des systèmes agricoles et forestiers à haute valeur naturelle et des paysages agricoles traditionnels, eau et changement climatique.

3. Amélioration de la qualité de vie dans les zones rurales et encouragement de la diversification. Les ressources allouées à l'axe 3 devraient contribuer à la priorité générale de création de possibilités d'emploi et des conditions de croissance. La série de mesures disponibles au titre de l'axe 3 devrait en particulier être utilisée pour encourager la constitution de capacités, l'acquisition de compétences et l'organisation de stratégies locales de développement ainsi que pour garantir que les zones rurales restent attrayantes pour les générations futures. Lors de la promotion de la formation, de l'information et de

l'esprit d'entreprise, il devrait être tenu compte des besoins particuliers des femmes, des jeunes et des travailleurs plus âgés.

4. Constitution de capacités locales pour l'emploi et la diversification. Les ressources allouées à l'axe 4 (Leader) devraient contribuer aux priorités des axes 1 et 2 et, surtout, de l'axe 3, mais également jouer un rôle important pour ce qui est de la priorité horizontale visant à améliorer la gouvernance et à mobiliser le potentiel de développement endogène des zones rurales.

5. Traduction des priorités en programmes. Dans leur stratégie nationale, les États membres devraient veiller à optimiser les synergies entre les axes et à l'intérieur de ceux-ci et à éviter les contradictions éventuelles. Ils pourront également réfléchir à la façon de prendre en considération d'autres stratégies de l'UE, en particulier dans le domaine de l'environnement.

6. Complémentarité entre les instruments communautaires. Il y a lieu d'encourager les synergies entre les politiques structurelles, les politiques de l'emploi et les politiques de développement rural. Dans ce contexte, les États membres devraient veiller à la complémentarité et à la cohérence des actions qui doivent être financées par le Fonds européen de développement régional, par le Fonds de cohésion, par le Fonds social européen, par le Fonds européen pour la pêche et par le Fonds européen agricole pour le développement rural sur un territoire et dans un domaine d'activité donnés. Les principes directeurs essentiels en ce qui concerne la ligne de démarcation et les mécanismes de coordination entre les actions faisant l'objet d'une intervention des divers Fonds doivent être définis au niveau du cadre de référence stratégique national (document stratégique national concernant la politique de cohésion) et du plan stratégique national pour le développement rural.

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ECONOMIC EFFICIENCY OF GROWING SUGAR BEET AND INFLUENCE OF SOWING

Аннотация: С сокращением посевных площадей сахарной свеклы существенно уменьшилась научная привлекательность этой культуры, поэтому недостаточно исследуются процессы роста и развития, формирования урожая в зависимости от элементов технологии выращивания.

Решить эти проблемы возможно только за счет изучения оптимальных сроков посева и уборки, что в свою очередь повлияет на эффективность выращивания сахарной свеклы.

Ключевые слова: сахарная свекла, рентабельность, эффективность, сроки посева, сахаристость.

Intensification of agriculture and improvement of production increase its production to more demanding of Agricultural Sciences on the development of new methods and technologies of growing crops that will provide a more complete and efficient use of material and technical base and scientific potential to produce high and stable yield.

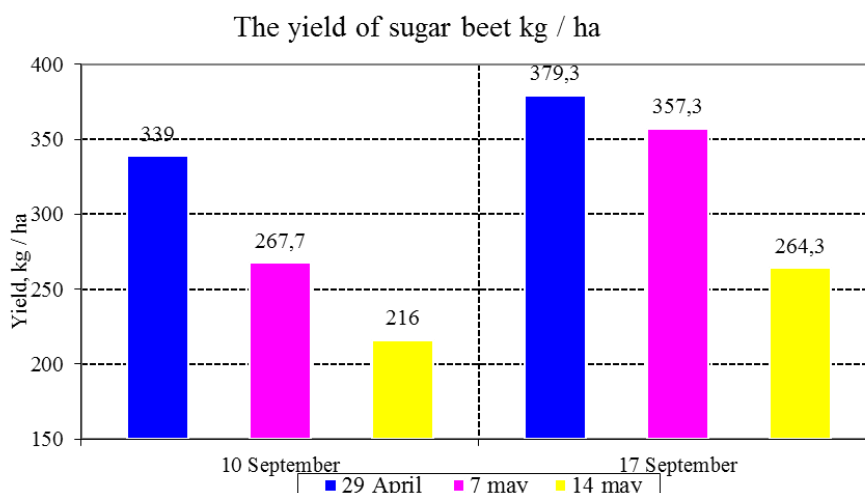
At this stage, new requirements to the level of productivity of crops and yield formation processes scientist agronomist has enough knowledge and information that he was given one factor depends simple experiments and limited research on this or other technological methods. To ensure high yields, it is necessary to have knowledge of a large variety of actions and interactions of factors and conditions that are involved in the process of growth and development of plants.

Forming part - productive complex process, which is determined from one side of the plant genetic potential, that is, its biological features, on the other - the external conditions in which they are implemented. By adjusting the external conditions, we are able to

control the productive process within the biological characteristics of culture, its varieties and hybrids.

In this regard, we conducted a study of the impact of the timing of sowing and harvesting on productivity of sugar beet roots (Fig. 1-3).

Fig. 1 yield of sugar beet roots (2011)



As a result of the experiments, it was found that sowing significantly influenced the growth of the mass of roots. So in the first version, these figures were the highest and gradually decreased with delay of sowing and reached 339, 267.7 and 216 kg / ha (Figure 1). It follows that the prior sowing the higher yield of root crops, in addition, yield increases on all versions depending on the duration of the collection and is the excess of 40.3 in version 1 to 89.6 kg / ha in 2 version.

In 2012 (Figure 2) was the largest crop in the first version and was 368.7 and 401.1 kg / ha depending on harvesting times. The lowest yield in the third version and was 266.6 and 302.1 kg / ha depending on harvesting times. The increase in yield was 19 days from 32.4 in version 1 to 40.6 kg / ha in 2 version.

In 2013 (Figure 3) was the largest crop in the first version and was 328.6 and 336.1 kg / ha depending on harvesting times. The lowest yield in the second version was 302.1 and 318.7 kg / ha depending on harvesting times. The increase in yield was 19 days from 26.5 in version 1 to 17.4 kg / ha in 2 version.

Fig. 2 The yield of sugar beet roots (2012)

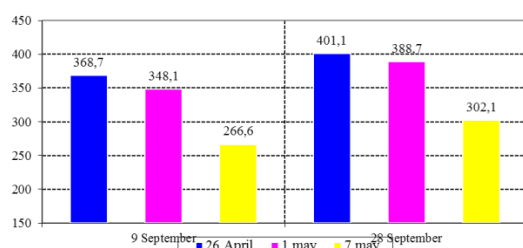
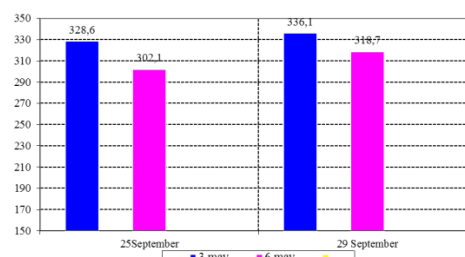


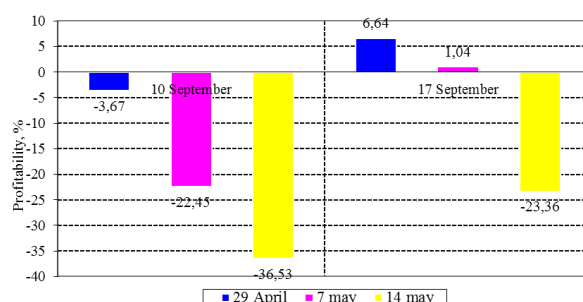
Fig. 3 The yield of sugar beet roots (2013)



Calculation of economic indicators consisting of equal yield of sugar beet experiments, the cost of production, which depends on the level of productivity, production costs per 1 ha of return in USD / profitability.

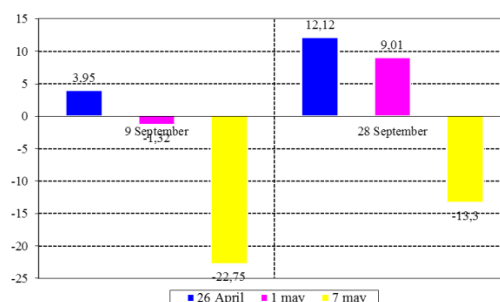
If you set the price of economic efficiency harvest in 2011 was 165.0 UAH. in 2012 - 195 UAH. Root for 1t beet sugar content to basis at 16%. In 2011, the reported subsidy per 1 ha in 2008 it was 750 UAH/1 ha. And the price of the harvest in 2013 is 338 UAH/ t.

Figure 5. The profitability of growing sugar beet 2012



The data in Figure 4 show that the sowing April 29 and in conjunction with the September 17 gathering achieve maximum profitability 6.64% and energy efficiency factor of 1.07. In the second embodiment, these figures are 1.04% and 1.02, respectively. If replanting (3 version), we have a big loss.

Figure 6. The profitability of growing sugar beet 2013



In 2012 at sowing April 26 and September 9 harvested crop profitability is 3.95% and the energy efficiency ratio of 1.05, while

collecting 28 September - 12.12% and 1.12, respectively. When sowing May 1 and September 28 collection efficiency is 9.01% and the energy efficiency ratio 1.09. If replanting (3 version), we have a loss.

Conclusion. Thus, in 2013 at sowing 3 May and harvested crop September 25 return is 1.19%, and the energy efficiency ratio of 1.05, while sowing 3 May and collecting 25 September - 1.09% and 1.12, respectively. At sowing on May 6 and September 29 collection efficiency is 12.1% and the energy efficiency ratio 1.09. Thus we can say that the highest efficiency was 12.1% at sowing 3 May and collecting 29 September.

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IMPROVEMENT OF DAIRY PRODUCTS DISTRIBUTION IN THE COLLECTIVE FARM "RODINA PY-ATNITSKOGO" IN VORONEZH REGION TALOVAYA DISTRICT

Аннотация: В данной статье говорится об оптимизации каналов распределения молочной продукции путем внедрения молокоперерабатывающего комплекса, а также исследуется эффективность использования различных каналов сбыта продукции.

Ключевые слова: рынок, каналы распределения продукции, переработка молока, эффективность переработки.

In the conditions of market economy the highest efficiency is shown by those farms which follow requirements of the market, produce biologically complete, environmentally friendly products which are in demand for buyers.

Therefore, in modern conditions planning the production process it is necessary to study the demand, current and predicted level of market prices of the relevant product.

Otherwise products can't find sale or will be realized on unprofitable for the producer conditions.

Agricultural producers realize their products almost independently. The main sales channels for them are processing companies. Marketing policy in modern conditions remains quite a relevant and important field of activity of the enterprise.

Marketing policy, especially in regional and foreign markets, assumes the certain deliberate actions of administration of the business constructed on such principles due to effective transportation, warehousing, storage, completion, packing, advance to wholesale and retail traders, presales, actually sale of goods and an aftersales service of goods are provided [2].

Market, development and carrying out policy should be based on good knowledge of the markets (external environment) and opportunities of the business (internal environment), i.e. on material which can be received as a result of implementation of full-scale analytical and marketing function.

Well-established sales policy will cause the expansion of demand for any product, contribute to the commercial success of the business, and increase its prestige.

The channel of distribution is a set of legal or private persons who assume or help to transfer to someone else the ownership of the product or service from a producer to a consumer. Thus the channel of distribution is a way by which goods move from producers to consumers. Due to the channel of distribution long gaps in time, place and ownership, separating goods and services from those who would like to use them are eliminated [1].

It is well known that agricultural production has the two-level marketing channel, first when the producer realizes the products to the wholesalers, then they resell products to retail dealers, who eventually bring products to the consumer.

But in my opinion agricultural producers must strive to selling products by direct sales, or directly to the consumer.

Let's try to prove the efficiency of the proposed method on the example of the collective farm «Rodina Pyatnitskogo» which is situated in Talovaya district, Voronezh region.

The main activity of this company is production and sale of agricultural products. At the same time collective farm «Rodina Pyatnitskogo» specializes in the production of milk. As the average share of proceeds from the sale of milk for 2010 - 2012 in the total revenue of the enterprise is 50%.

For the implementation of the given ways to reduce distribution channels of products it was proposed to install a complex for dairy products processing in the company. This will allow selling products directly to consumers, bypassing intermediaries that assign a big portion of revenue which belong to the producers. Competition in the area is formed primarily by imported products, respectively, the prices for these products are inflated. This creates a favorable environment for the establishment of milk processing plant of average power on the basis of the collective farm «Rodina Pyatnitskogo».

This plant will allow the company to sell different products at lower prices, than competitors, and thus to increase competitiveness of the company.

For goods production, own production milk will be used, this significantly reduces the cost of raw materials purchase. However, not all milk produced by the company will be used for processing. It is planned that 1100-1500 liters of milk per day will be processed, the rest will be sold to dairies. The range of products: includes milk, cottage cheese, sour cream, and yogurt.

The following table illustrates how effectively the establishment of milk processing plant is.

Table 1 - Calculation of milk processing plant payback in the collective farm «Rodina Pyatnitskogo»

Name	Quantity
1	2
The volume of processed milk per day, kg	1500
The number of staff	3
Energy consumption per day, kWh	150
The duration of the month, days	30
Salary per employee, RUB/day	450
The cost of the complex, RUB	3195000
Installation costs, RUB	319500
The cost of milk, RUB/kg	12,1
The selling price of finished products, RUB/kg:	
milk	30
sour cream	75
cottage cheese	95
yogurt	50
Production costs	
Costs per day, RUB:	
Advertising costs	750
The cost of milk	18150
The packaging costs	4674
The cost of purchasing the starter culture for yogurt	3000
Energy costs	750
Staff wages	1350
Calculation of income from production	
The cost of sales of finished products, RUB:	
milk, 1080 kg	32400
sour cream, 40 kg	3000
cottage cheese, 50 kg	4750
yogurt, 30 kg	1500
Total costs per day, RUB	28674
Total income per day, RUB	41650
Profit per month, RUB	389280
The payback period, month	9,0

As a result we see that the implementation of a complex for milk processing is beneficial, since the revenues from the production will exceed the costs. In the future this will allow expanding the production.

Another important factor necessary for the efficient operation of the company is the right choice of distribution channels.

For example the collective farm «Rodina Pyatnitskogo» evaluates the efficiency of the economy by the use of different sales channels.

The collective farm «Rodina Pyatnitskogo» is situated in Talovaya district, Voronezh region. The company has multiple sales channels. For example city milk factory "Liskynsky" or Anninsky dairy factory. However, the best channel in our opinion is dairy factory "Voronezhsky", which offers 1500 rub/kg as the selling price of milk or Rossosh dairy factory, with the selling price 1450 rub/kg.

Table 2 - Efficiency of milk production in the collective farm «Rodina Pyatnitskogo»

The performance indicators	In the com- pany in 2012 year	Project	
		Rossosh dairy fac- tory	Dairy factory "Voronezhsky"
Start information			
Projected gross milk yield, 100 kg	29231	29231	29231
Cost of 100 kg of milk, RUB	1210	1210	1210
Commodity milk	27858	27858	27858
Selling price, RUB/kg	1349,2	1450	1500
The revenue from the sale of milk, thousand ru- bles	37586	40394	41787
Cost of sales, thousand rubles	33708	33708	33708
Indicators			
Profit, thousand rubles	3878	6686	8079
Profitability, %	11,5	19,8	24,0

As a result, we see that if the company realizes the produced milk to Rossosh dairy factory, it will increase its profit up to 2808 thousand rubles and selling products to the dairy factory "Voronezhsky" the company is able to increase its profit up to 4201 thousand rubles. Thus it was proved that the right choice of sales channels is one of the most important factors of effective activity of the enterprises.

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TYPES AND ROLES OF INTEGRATION IN SUGAR BEETROOT SUB-COMPLEX OF RUSSIAN AGRO-INDUSTRIAL COMPLEX

Аннотация: Рассмотрены формы интегрированных формирований и пути совершенствования интеграционных процессов в свеклосахарном подкомплексе.

Ключевые слова: свеклосахарный подкомплекс, сырьевые зоны, конкурентоспособность, интегрированные агропромышленные формирования, агрохолдинги.

During the agrarian reformation in Russia the industrial interconnections among the branches of agro-industrial complex formed before within plants, inter-plant units and other similar structures were seriously disrupted. Contradictions arose between the interests of former participants of such agro-industrial structures. Meanwhile the agricultural companies were the ones put at disadvantages due to monopolistic tools of influence upon them in the hands of processing and service companies.

Such disadvantage should have been expected and is intrinsic as low purchase power of the population and lack of protective measures from the government made the processing plants try and increase their product competitiveness pressing unfair purchase prices and processing conditions on the agricultural manufacturers.

Deep crisis spreading within agro-industrial complex of our country affected also the beetroot sugar sub-complex. Market reformations in agriculture were accompanied by negative processes obstructing its development such as considerable reduction of crop acreage, decrease of productivity and total yields of sugar beetroot, decline of financial state of the firms of the branch. Reduction of beetroot production volumes caused stagnation in the key parts of the beetroot

sugar sub-complex and service sectors accompanied by reduction of beetroot seeds production, processing capacity loading and even shut-down of scores of plants in various regions.

Weakness of governmental agricultural policy in sugar production has led to imbalance between its key elements and firms, disruption of business behavior, reduction of governmental influence upon the reproduction process, curtailing of cooperation, criminalization of sugar market, and rise of numerous intermediate dealers.

Study of sugar beetroot crop area location within the country and its regions suggests investigation of two inter-connected factors: crop area location depending on soil and climate conditions providing for natural increase due to natural factors, and beetroot crop growing areas taking into account the distance from the processing points directly affecting the amounts of expenses and economic productivity of the sub-complex.

Processing of large volumes of beetroots requires rational organization of raw material base and farm profiles from both agriculture and sugar industry. Raw material base of a sugar plant means the aggregate of beetroot growing farms providing the raw material for the plant, are located close to it, and constantly cooperate with it. Optimum organization of raw material zones means such allocation of beetroot crop areas when the demands of the sugar plant are fully satisfied throughout the season under minimum transport cost and transport loss reduction. Optimization of raw material zones is aimed at the increase of sugar production efficiency.

Under the existing conditions the problems of production and processing of sugar beetroot integration are of the topmost importance as well as improvement of organizational and economic means of interaction between beetroot growing farms and sugar plant based on the purpose of obtaining the final result. Production and economic links are the key element of integration within beetroot sugar production. It is due to the fact that beetroot growing, purchasing, storing and processing form the united technological process. Thus, it is just rational to organize not just technological, but also structural, economic alliance of agricultural and processing production in order to gain synergy effect.

Necessity and suitability of agro-industrial integration are justified by its ability to provide for:

- effective resource distribution among the subjects of the integration;
- mitigation of seasonality of agricultural production and income provision due to combination of many types of activities;
- reduction of climate dependence due to special diversification;
- withstanding the power of agricultural product market by means of large-scale planning and supply consolidation;
- increase the competitiveness of agro-business;
- reduction transaction costs;
- increase the investment attractiveness of production.

Participating in the integrated business forms for most of agricultural companies is mostly caused by the necessity of production risk reduction, particularly the dependence on natural conditions, stochastic nature of agro-markets, dictate from processing plants, and low competitiveness of the production.

Necessity of creation of integrated business forms of processing and service enterprises is caused by their desire to provide for stable profitability of their business by means of securing the raw material base, efficient use of raw materials, increase of the product quality, reduction of its cost, and market capture.

At present two types of agro-industrial associations are defined – those with full and partial process cycle. The former type includes the forms where the product is gradually moved from the agricultural farm to the sale of the final industrial product. The latter type is usually based on the cooperation with various business purposes.

Lately the most prospective integration form in sugar beetroot sub-complex is agro-industrial holdings. Holding form means an aggregate of legal entities interconnected by means of contracts and property where the head company manages the activities of the affiliates. The composition of the agro-industrial holdings is defined by the necessity of harmonious combination of agriculture, processing plants, trading, financial structures, suppliers, and other companies.

The effect of beetroot growing farm participation in agro-holdings is defined by the fact that it supports large-scale commodity production, helps avoiding bankruptcy, and attracts inflow of investments enabling production reengineering, guarantees sugar beetroot and other agricultural commodity sales. Agro-holding formation will help in coordina-

tion of business activities of all its participants as well as marketing and information development to provide for the needs of holding participants.

The effect of integrated production development may be provided in case of very tight bounds and all structural units in which case the efficiency and each unit shall grow as well as the total efficiency of the final product manufacturing. Gradual transfer to higher type formations like holdings is required, where realization of economic interests of participants in cooperated production will be possible. Observations prove that it is possible to considerably improve the existing links between the processing plants and raw material zone farms. At the same time it is possible to guarantee mutual interest of these enterprises with trading companies in terms of supply, storing and sales of sugar as well as compensation of some part of commercial expenses.

Thus, agro-holding formation in sugar beetroot sub-complex allows solution of the following problems:

- accumulation of financial resources for priority trends of development of agriculture and its service branches;
- integration of production, processing, trade and financial structures;
- improvement of financial state of agro-industrial companies and organizations;
- increase of product competitiveness;
- overcoming local monopolies and extra intermediate parties;
- increase of control over effective use of industrial capacity, labour and technological discipline;
- use of new technologies, highly efficient machinery and other results of scientific progress in agro-industrial production.

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THE PLACE OF EXCHANGE IN THE REPRODUCTION PROCESS

Аннотация: В статье раскрыто место отношений обмена в воспроизводственном процессе. Изучены различия экономической системы Советского государства от рыночной экономики России.

Ключевые слова: Обмен, производство, отношения обмена.

Reproduction is the basis of socio-economic systems, ensuring continuity of production and consumption processes in the framework of satisfying the needs of the whole society. Traditionally the process of reproduction is considered in the context of its main stages: production - distribution - exchange - consumption. From the viewpoint of the society the main purpose of reproduction is to provide its growing needs in the long term period minimizing the final cost of consumable goods, works and services. That is, reproduction process control should be focused on three main objectives: first, to ensure the conformity of production to the needs of society (balanced socio-economic system); secondly, to ensure the economic availability of goods and services (minimizing production and distribution costs); third, is the compliance with the proportionality stage of the reproductive process (the balance of the process)

Within the limited resources, the control system determines the necessary social reproduction the proportion of resource allocation by the stages of the reproduction process. The economic system of the Soviet state, based on the principles of Marxism, gave priority to material production as the main stage of reproduction in relation to the distribution, exchange and consumption because its cost is created at the production phase.

But Russia transition to market economy radically changed the system of commodity-money relations characteristic of centralized management system of social reproduction. To replace the system of guaranteed procurement of all the products and provision of resources within the limits set by a fixed long-term rates virtually regulated market requiring the formation of a fundamentally new system of sales organization and resource provision of business entities was introduced.

EA Maximova [1] rightly points out that the Russian market is constantly changing, and its institutional framework is developing in conditions of rising imbalances of production and circulation, cooperation causing complication of interbranch interactions. At the same time, in her opinion the production becomes less efficient and the potential difference of production and circulation is steadily increasing.

Asymmetry of market structuring and market itself is growing, due to the shift in trade flows balance in the channels of domestic market goods supply towards a network retail trade.

F.N. Zavyalov writes about the growth of reproduction processes as asymmetry [2]. He mentions a sharp expansion exchange. As the main reason for this, he noted the following points. Being confident in the power of the regulatory role of the market, the government gave the sphere of exchange at the mercy of mediation and commercial structures, which gave rise to a large amount of speculation, the elimination of the monopoly of foreign trade and rate on free pricing led to a domestic producers crowding out. The exchange increase was due to prolongation of goods supply chain to final consumers. The dominance of the exchange over the sphere of production caused flow of resources, both due to the formation of new jobs and a higher level of

wages in this sector compared for example to agriculture and forestry, consumer services, etc. The sphere of exchange causes growth of money circulation. This affects the growth of prices and inflation, against the background growing monopolization of the exchange due to the growing influence of large retailers and wholesalers. In this case, there is a steady trend of transition from production to consumption economy.

Complication of exchange relations and almost complete elimination of the state from regulating metabolic processes led to the fact that the costs associated with product sales and acquisition of resources, including transactional and marketing spends in the structure of the cost of production. It greatly influenced the sharply increased efficiency production and financial activities of all economic actors, especially in the agricultural sector, characterized by pronounced production seasonality, the high level of price volatility of agricultural products, poor storage and market infrastructure, the presence of a large number of small producers, etc.

The current level of information technologies development can significantly improve the quality of the work related to the study of agricultural markets and the resources markets necessary for agricultural production process to reduce the time for information search and its processing, to improve the accuracy of calculations, to reduce the costs associated with the sales and supply organization of agricultural business entities, finally to increase the efficiency of agricultural producers.

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***Секция IV. Вклад молодых ученых в инновационное
развитие ветеринарной медицины и технологий
животноводства***

***Section IV. Contribution of young scientists into
development of veterinary medicine and technology of
animal husbandry.***

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**THE PROBLEM OF DOGS DIROFILARIOSIS
DISTRIBUTION IN RUSSIA: CURRENT SITUATION
STUDY**

Аннотация. В статье приведены современные данные, отражающие масштабность проблемы диروفилариоза собак в России. Даны результаты собственных исследований по эпизоотологии диروفилариоза в условиях Воронежа и Воронежской области.

*Ключевые слова: диروفилариоз, *Dirofilaria immitis*, *Dirofilaria repens*, трансмиссивный, экстенсивность инвазии, распространение, инвазированность.*

Dirofilariosis is transmissible parasitic disease caused by the nematode family *Onchocercidae* genus *Dirofilaria*. Two forms of the disease are defined - heartworms caused by *Dirofilaria immitis* and subcutaneous caused by *Dirofilaria repens*.

Carriers of the pathogen are mainly mosquitoes, although other blood-sucking insects (ticks, horseflies, lice, fleas) were registered. Dogs, cats, wild carnivores suffer from dirofilariosis. Infestation is special danger for people [1].

At present the question of dirofilariosis spread is well studied in the Primorsk, Khabarovsk, Krasnodar, Stavropol regions, in the repub-

lice of the North Caucasus, in the Republic of Kalmykia, in the Astrakhan, Volgograd and Rostov regions. Analysis of the available literature shows that nematode *D. immitis* infected dogs amounted in Krasnodar region – 62,6% [5], in Rostov region – 47,7% [6], in Novgorod region – 28,7% [3], in Chechen Republic – 20,0% [9], in Volgograd region – 19,0%, in Khabarovsk region – 13,0 [1], in Nizhny Novgorod region – 12,8% [8], in Saratov region – 12,8% [1].

Highly infected by *D. repens* were dogs in Krasnodar region – 55,6% [5], in Chechen Republic – 54,0% [9], in Rostov region – 52,3% [6], in Republic of Kalmykia – 29,3%, in Volgograd region – 24,2%, in Republic of Adygea – 23,9%, in Primorsk region – 20%, in Khabarovsk region – 13,0%, in Astrakhan region – 2,9% [1]. In Moscow region until 2003 only sporadic imported cases of invasion were recorded. However, in the study in 2003 of domestic dogs blood dirofilariosis was detected in 5% of cases [10].

Currently, there is a tendency of dirofilariosis spread not only in the southern regions, but also in the regions with temperate climate. The area of the disease extends to the north, capturing all the great territory.

The reason for this may be factors such as general warming of the Earth; unlimited movement of people and infected dogs from one region to another; increasing population of dogs; high risk of importation from other countries in connection with the widespread in the border areas and the inability to establish the diagnosis in animal quarantine period because of the long incubation period; adaptation of *Dirofilaria* to different species of mosquitoes and other insect species as intermediate hosts and fitness of larval stages in the development under different temperature regimes; limiting the use of chemical means of protection against bloodsucking insects, including mosquitoes, and inadequate arsenal of highly effective and non-toxic anthelmintic against adult parasites.

All this creates favorable conditions for the emergence of new hotbeds of dirofilariosis dogs, and this increases the risk of human infection [1]. In Voronezh region epizootic situation on heartworm unknown until now. For the first time in 2001 the discovery of *Dirofilaria* in dogs in the territory of Voronezh reports N.S. Bessalova et al.

(2005) [2]. According to N.S. Poustovit et al. (2009), nematode *D. immitis* infected dogs in Voronezh region is 38% [4].

According to the research in 2011 P.I. Nikulin, B.V. Romashov found that the extent of infestation *D. repens* is 9% [7].

Available data reflect infestation in dogs only in the Voronezh Reserve and insufficient to determine features of epizootiology in the population and the development of evidence-based fighting system in the area.

Thus, the study of distribution and clinical manifestations of dirofilariosis in dogs in Voronezh and Voronezh region is a very popular and important issue.

We studied 424 dog blood samples. Dirofilariosis was diagnosed in 52 cases (12.3% extent of infestation). Different extent of infestation in different social groups of dogs is: 24.1% - among the homeless (of 29 surveyed), 24.6% - security (65) and 8.8% (of 330) - in the indoor dogs. With regard to species, then *D. immitis* was found in 19 cases (36.5%), *D. repens* - in 33 (63.5%). With regard to social class - *D. immitis* in homeless dogs has not been detected, at security dogs it was detected in 43.7% of cases (7 animals), in indoor dogs – 41.4% (12 animals); *D. repens* in homeless dogs it was found in 100% of the cases (7 animals), security - in 56.3% (9 dogs) indoor - in 58.6% (17 dogs).

Dirofilariosis is more common in males. Subcutaneous form of dirofilariosis occurs twice as often as the heart form. The level of contamination is correlated with the type of content of the dogs, their social class and habitat. Thus, 75% of the infested dogs were kept in aviaries of private houses near the forested areas of the city, in areas of the coastal part of the Voronezh reservoir or in villages to the River Don.

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**GROWTH, DEVELOPMENT AND MEAT
PRODUCTIVITY OF SPECIALIZED BEEF CATTLE IN
THE CENTRAL CHERNOZEM REGION**

Аннотация: Современное развитие мясного скотоводства, обусловленное внедрением прогрессивных технологий производства говядины с высоким уровнем механизации и автоматизации трудоемких процессов, обострило проблему выбора используемых в России пород крупного рогатого скота и выбора пути их совершенствования. В этой связи, стоит задача получения конституционально крепких животных, способных в условиях промышленной технологии производства говядины не только реализовать свой высокий генетический потенциал по продуктивным качествам, но и при этом сохранить хорошую плодовитость и продолжительный срок хозяйственного использования.

Ключевые слова: Мясное скотоводство, рост, развитие, специализированный симментальский мясной скот, первоначальная бонитировка.

A cattle breeding is the predominant livestock industry. This is because today cattle gives more than 98% of the milk and about 25% of beef - main livestock food of our population. The increase in the production of high quality livestock products - the problem is that acquires a special relevance for the whole country and for our region. This is due to the decline in the number of cattle and the production of beef.

The way forward is the development of beef cattle. Until 2010 specialized beef cattle in our area as the industry was missing. Over the last two years the situation has changed for the better.

Beef cattle faster and more economical processes of different food products in the more tender and tasty meat has a higher carcass yield than dairy cattle and milk - meat breeds.

First, in terms of industrial technology of meat production in the Central Chernozem zone of Russia will be studied the growth, development and meat productivity of specialized Simmental beef cattle.

On the basis of the result of research results have provided specific suggestions for further use of specialized Simmental cattle in the Central black earth region. The research is conducted in the village of bear Karachaevskogo district of Voronezh region.

In the first phase of an experimental part was carried out an initial appraisal of beef cattle produced results that indicate cold direction of this breed. Further work studied the following parameters: growth, development (body weight, measurements articles - height at withers, height at rump, oblique body length, breast width for the shoulder blades, chest girth behind the shoulder blades, chest depth, and on the basis of measurements, we calculated indices of body weights), indicators of meat productivity, quality assessment of meat, ethological indicators, hematological parameters.

The main research results obtained in the experiment will be processed by the method of variation statistics with the definition of reliability for the Student using a personal computer and a software package Excel.

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CLINICAL AND HEMATOLOGICAL CHARACTERISTICS OF CATS TOXOPLASMOSIS IN THE TERRITORY OF VORONEZH

Аннотация: В условиях Воронежа описаны клинические проявления врожденного острого и хронического токсоплазмоза у кошек, содержащихся в домашних условиях и имеющих тесный контакт с человеком.

Ключевые слова: токсоплазмоз, кошки, кровь, гематология, антитела, иммуноферментный анализ, клинические проявления.

Pet's toxoplasmosis is a widespread invasive disease that causes a wide spectrum of clinical manifestations of the disease, such as pneumonia, enteritis, conjunctivitis, urethritis, encephalitis, abortions, congenital anomalies of the fetus and stillbirth.

The causative agent affects the nervous, lymphatic, cardiovascular, reproductive, immune system of the body, most often runs a chronic asymptomatic and latent, sometimes it is sharp in form and is a serious threat to human health (risk of human infection from animals).

The causative agent of toxoplasmosis is the simplest intracellular parasite - Toxoplasma (Toxoplasma Gondi). Domestic animals are the main source. The life cycle of Toxoplasma is held with the participation of final and intermediate hosts. Definitive hosts of Toxoplasma are the representatives of the cat family, and intermediate are many species of mammals and birds. Toxoplasma parasites are not only in organs and tissues of cats (which is typical for the ill animals and human), but also in the intestine. Toxoplasma feces are displayed in the environment where they retain their viability in the form of cysts for a half year and may cause disease in human bodies.

Considering the symptoms of toxoplasmosis in cats its diversity should be noted: cachexia, discharge from the nose and eyes, weak-

ness, depression, fever, diarrhea, and various nervous disorders, reproductive disorders, abnormalities of eye.

A wide variety of clinical manifestations of chronic or latent toxoplasmosis, sometimes during acute toxoplasmosis, complicates its differential diagnosis from other diseases by symptoms. Definitive diagnosis requires obligatory use of laboratory methods.

Unfortunately in Voronezh and Voronezh region, toxoplasmosis and its clinical and hematological manifestations are not well studied. There are some publications on the problem. So S.P. Gaponov, I.S. Menyaylova indicate high contamination of animals by toxoplasmosis in the autumn-winter period, 67.88% (seropositive) of the studied cats in the Voronezh region, tested by ELISA (2011). I.S. Volgina indicates a high degree of infestation of cats in Voronezh 67.5% (2009).

Diagnosis of toxoplasmosis requires comprehensive laboratory diagnostics, allowing identifying the pathogen, set hematological and biochemical changes in the body to determine the stage of the disease and the need to justify the appointment of specific antiparasitic and antibacterial drugs.

The purpose of the research is to establish the nature of the clinical manifestations of toxoplasmosis in cats in the city of Voronezh, as well as the changes in hematological and biochemical blood profile in cats with toxoplasmosis.

The studies were conducted at the leading veterinary clinics of different administrative regions of Voronezh, which treat animals, both from urban and surrounding areas. During the period from September 2013 to August 2014 120 cats aged from 1.5 to 9 were studied, the owners of the animals applied with various complaints on the health of their pets. The diagnosis of toxoplasmosis was set based on clinical manifestations and on the basis of studies of the blood by ELISA. Blood sampling for biochemical studies were conducted in vacuum tubes. Blood tests for the main indicators were performed using biochemical analyzer Stat Fax 4500+. Clinical scores (total hemoglobin, erythrocytes, lymphocytes and leukoformula) was determined by automated laboratory blood analyzers.

During the study we analyzed 120 blood samples. We have found that 40 cats examined (33.33%) had a significant level of specific antibodies. This group consisted of animals with different clinical signs (conjunctivitis, enteritis, endometritis, urethritis, mastitis, reproductive disorders, congenital abnormalities and stillbirth of the fetus).

The most common were cats with impaired reproductive function - 22 cats (55%). Leukocytosis was found in the blood ($18.5-19.5 \times 10^3 / \text{ml}$) relative lymphocytosis (52-61%), eosinophilia (4-9 %). It is worth mentioning that pregnant cats showed eritropeniya ($4.1-4.5 \times 10^6 / \text{ml}$), decreased hemoglobin (68-75 g / l). Biochemical parameters: increase were the following or total protein (79-85 g / l) alaninaminotranferazy (75-86 U / l), aspartate aminotransferase (53-76 U / l), and alkaline phosphatase (55-63 U / l) glucose lowering (2.8 - 3.1 mmol / l).

Twenty-eight cats (23.33%) had antibodies in diagnostic titers (1:32). Deviations from normal hematological and biochemical parameters were not found.

Thus, 56.66% of the investigated cats proved positive reaction for toxoplasmosis.

Fifty-two animals (44.34%) had a negative result.

In particular, in three cases we identified specific IgG antibody titre of 1: 128. These cats were pregnant. In one of them, no abnormalities during pregnancy were observed. Cat endured kittens for 63 days, but could not give birth to its own and it was carried out a caesarean section. During the operation 4 fetus were removed of the uterus. One fetus was with a congenital malformation: had two heads, four hind limbs, two tails, and was subjected to eutonazii at the request of the host. The other kitten visible physical abnormalities were not found. However, on the third day after the surgery they died from acute toxoplasmosis, all the blood IgM was found.

We found that in conditions of Voronezh and Voronezh region the chronic form of toxoplasmosis is a predominant in cats with clinical manifestations of gynecological diseases. Pregnant cats suffer from eritropeniya hemoglobin decrease, total protein, alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase increase, glucose levels decreased.

The studies have shown that on the territory of Voronezh and neighboring rural areas of Voronezh region toxoplasmosis in cats is diagnosed in 56.66% cases. Dominated is the chronic form of the disease with clinical manifestations of obstetric and gynecological pathologies. At the same time in the blood of the infected animal leukocytosis, relative lymphocytosis, eosinophilia, eritropeniya, decreased hemoglobin level, increase of the following biochemical parameters:

total protein, alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, decreased glucose observed.

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TO THE QUESTION OF EMBRYOS DEATHS AND DELAYS IN DAIRY FETAL COWS DEVELOPMENT

Аннотация. Задача исследований заключалась в разработке критериев ультразвуковой диагностики СЗРП и выявлении роли гормонально-метаболического статуса коров в патогенезе данной патологии беременности.

Ключевые слова: коровы, гибель и задержка развития эмбрионов и плодов, патогенез и УЗИ-диагностика

The studies were performed on cows of black-and-white Holstein and red & white cattle (n=97) with average annual milk yield of 6.0-7.5 thousand kg, including the timing of pregnancy 38-40 days - 56 animals, 60-65 days - 41 animals. Evaluation of the status of their genitals and size of the embryo/fetus was carried out by transrectal palpation and ultrasound using an ultrasound scanner «Easi Scan 3»

with a linear sensor of 4.5-8.5 MHz. We determined the size of the horns and the fetus, its consistence, coccygeus-parietal size and diameter of the embryonic body. Carrying out the assessment of indicators the data of the observed literature and the results of the research were analysed. After clinical and sonographic examination of 29 cows venous blood was obtained for laboratory tests to evaluate the metabolic status of the animals. The repeated the blood samples from these animals were received at 230-240 days of pregnancy. By end of the current pregnancy the character of the delivery and the postpartum period, weight of the newborn and placenta, and the emergence of calf confident postures of standing and sucking reflex, the appearance of diarrhea syndrome were taken into consideration.

Pathology of pregnancy in high-producing cows in the form of intrauterine growth retardation and the death of embryos and fetuses is rather widely spread. The key point in its formation is the impaired nutrition of the embryo at the stage of implantation and early placentation associated with the incompleteness of the secretory transformation of the endometrium and the delay in the formation of the placental-fetal blood flow caused by an imbalance in the synthesis of sexual and corticosteroid hormones and nitric oxide. One of the determining factors that cause functional failure of the system mother-embryo-fetus is the decreased level of immunobiological reactivity and detoxification systems of the body of the mother.

In the diagnosis of early embryonic/fetal deaths and delay of their development an important part should be given to ultrasound scanning of the genital organs, which is held on 28-31, 38-42 days or later after insemination. Typical signs of embryonic/ fetal deaths at embryonic stage of their development in the second study (38-42 days) are: the absence of an embryo, the amniotic SAC and amniotic fluid; oligohydramnios in the absence of the embryo; the embryo is visualized, but no signs of a heartbeat. SDDEF Criterion on 38-42 day of gestation is the length of the embryo within 12-16 mm and diameter - 7 - 9 mm, and at 60-65 days respectively 25 - 45 mm and 12-16 mm. Diagnosis of intrauterine fetal death is possible at the gestational term of more than 45 days in most cases at the single study. Its symptom is the lack of heartbeat and physical activity.

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LA PESTE PORCINE AFRICAINE: LE PROBLEME ET LES SOLUTIONS

Аннотация: африканская чума свиней - высококонтагиозная вирусная болезнь, распространение которой в настоящее время приводит к колоссальным социально-экономическим последствиям в Российской Федерации и других странах. Для ее успешной ликвидации требуется не только проведение карантинных мероприятий, но комплекс мер по повышению эффективности деятельности ветеринарной службы на законодательном уровне.

Ключевые слова: африканская чума свиней, вирус, карантин, ветеринарная служба, дикие кабаны.

Aujourd'hui, dans notre pays, une grande attention est accordée à la médecine vétérinaire de la sécurité, car il s'agit de la santé de la population et de la qualité des produits (la viande du porc). La peste

porcine africaine se propage à la vitesse de l'éclair dévastateur des maladies virales, qui menace désormais à l'élevage de porcs dans le monde et entraîne une mortalité de bétail, conduit aux énormes effets socio-économiques. Ces dernières années, la peste porcine africaine a littéralement «fait un pas» à travers la Fédération de Russie et les autres pays.

La chose la plus dangereuse est que cette maladie est sujette à une propagation rapide, elle est causée par le virus à AND de la famille des Aspharoviridés, du genre Aspharovirus (le seul représentant de cette famille). Ce virus est très résistant aux intempéries. Il est inactivé par la chaleur à 56⁰C/70 mn ou 60⁰C/20 mn, à pH <3,9 ou >11,5 dans un milieu except de sérum. Le sérum accroît la résistance du virus (à pH 13.4 par exemple, la résistance atteint 21 heures sans serum et 7 jours avec serum). Le virus est sensible à l'éther et au chloroforme, hautement résistant aux désinfectants: inactivé par l'hydroxyde de sodium à 8/1000 (30 mn), les hypochlorites – chlore à 2,3% (30 mn), le formol à 3/1000 (30 mn), l'ortho-phénylprenol à 3% (30 mn). Il résiste longtemps dans le sang, les feces et les tissus, il peut se multiplier dans les vecteurs.

Les animaux sensibles sont les porcs, les phacochères, les potamochères, les sangliers d'Europe, les pécaries. Les porcins sauvages africains (phacochères et potamochères) présentent généralement des infections inapparentes. La transmission peut être directe ou indirecte. La transmission directe implique le contact entre les animaux malades et les animaux sains, la transmission indirecte passe par la consommation de déchets contenant de la viande contaminée, par les vecteurs biologiques – Argasidés du genre Ornithodoros (tiques) et les objets (locaux, véhicules, instruments, vêtements).

Les sources de virus sont le sang, les tissus, les sécrétions et les excréments des animaux malades ou morts. Les animaux peuvent être les porteuses, notamment les porcins sauvages africains et les porcs domestiques des régions enzootiques. Les sources importantes de virus sont également Argasidés du genre Ornithodoros (tiques).

Le tableau clinique de la maladie est très varié. Il existe trois formes de la maladie: aiguë, subaiguë et chronique. La forme aiguë est causée par les virus hautement virulents. Elle se caractérise par l'hyperthermie (40,5-42⁰C), la leucopénie et la thrombopénie précoces (48-72 heures), la rougeur cutanée (porcs à peau claire) – l'extrémité des oreilles, le queue, les parties distales, la face ventrale du thorax et

de l'abdomen, l'anorexie, la léthargie, le cyanose et les troubles de la coordination, 24 à 48 heures avant de la mort, l'augmentation du pouls et de la fréquence respiratoire, les vomissements, les diarrhées (parfois sanguinolentes) et les écoulements oculaires possibles. La mort survient dans les 6 à 13 jours, au maximum dans les 20 jours. L'avortement est possible chez les femelles gravides. Les survivants sont porteurs du virus à vie.

La forme subaiguë est provoquée par les virus modérément virulents. Les symptômes sont moins intenses, la maladie dure 5 à 30 jours, la mort est en 15 à 45 jours. Les femelles gravides avortent. La mortalité est plus faible (entre 30 et 70%).

La forme chronique se caractérise par les signes variables: perte de poids, pics non systématiques, signes respiratoires, nécrose de certaines zones cutanées, ulcérations cutanées chroniques, arthrite, péricardite, adhérences pulmonaires, gonflement des articulations. La maladie se développe en 2 à 15 mois. La mortalité est faible.

Le diagnostic comprend l'isolement du virus sur les cultures cellulaires et son identification par les tests sérologiques (ELISA, immunofluorescence directe et indirecte, immunoblotting), l'inoculation chez des porcs – vaccinés et non vaccinés contre la peste porcine classique, la détection du génome viral par amplification en chaîne par polymérase (PCR).

L'agent pathogène de la peste porcine africaine se caractérise par la variabilité constante. Une grande variabilité ne permet pas d'élaborer un vaccin efficace contre cette maladie infectieuse. Le traitement n'est pas développé.

L'agent causal de la maladie a pénétré pour la première fois sur le territoire de la Fédération de Russie avec des sangliers du territoire de la Géorgie en 2007. Le flash de la Géorgie a été le résultat de l'annulation des contrôles vétérinaires à la frontière du pays, à la suite de quoi, s'est produit un dérapage de l'agent pathogène de la maladie, qui a balayé l'ensemble du territoire de la Géorgie, et s'était propagé rapidement dans toute la Transcaucasie.

Depuis 2007, sur le territoire de la Fédération de Russie 735 épidémies de la peste porcine africaine ont été enregistrées, y compris la population de porcs sauvages - 334, la population de porcs domestiques - 370, objets infectés identifiés - 31. En 2014, sur le territoire de la région de Voronej 3 zones défavorisées par cette maladie ont été enregistrées.

A présent, l'épidémie de la peste porcine africaine a été enregistrée sur le territoire de 33 sujets de la Fédération de Russie. On les divise en trois zones endémiques: la zone sud s'est formée à la période de 2007 à 2010, la zone du nord et de l'ouest se sont formées à partir de 2011. La prévision sur la peste porcine africaine sur le territoire de la Fédération de Russie est défavorable.

Maintenant, la propagation de la maladie menace le territoire de l'Union Européenne, et ces dernières années, on observe une détérioration de la situation épizootique. Ainsi, en Lettonie, pour la dernière année 211 foyers de la maladie, en Lituanie, 64, Pologne, 41, en Estonie – 7 ont été enregistrés. Par conséquent, aujourd'hui, dans l'Union Européenne 323 flash de la peste porcine africaine ont été officiellement confirmé. Cette flambée est enregistrée comme parmi les porcs domestiques et les sangliers sauvages, pour la plupart, dans les populations près des frontières de la Pologne, de la Lituanie et de la Lettonie et de la Biélorussie.

La principale orientation de la lutte contre la peste africaine en Russie contemporaine, tenant compte de l'expérience du monde, est de détruire de porcs de la zone de quarantaine et la création d'un système maximal la protection des entreprises des porcs. La situation de la lutte contre la maladie est compliquée par le fait que la fédération vétérinaire est loin d'être une structure optimale. La structure moderne des services nationales vétérinaires a commencé à prendre forme, à partir de 2001, lors des négociations sur l'adhésion de la Fédération de Russie à l'Organisation du Commerce Mondial. Les représentants de l'Union Européenne et des États-Unis ont insisté sur un changement de la structure du Ministère de l'agriculture de la Fédération de Russie et de ses structures essentielles, y compris le service vétérinaire. Les experts de l'Union Européenne et des États-Unis ont insisté sur la création d'un système maximal favorable non seulement à la liberté du commerce, mais aussi aux intérêts de sécurité, y compris l'épizootie.

À la suite des innovations, le service vétérinaire du pays a perdu sa capacité du contrôle réel de la situation épizootique. En conséquence de cela, il est forcé de passer de l'activité régulière au contexte permanent de l'évolution de la situation d'urgence. Ce travail complique l'implication d'autres ministères dans le processus de contrôle de la propagation de la peste porcine africaine. En particulier, la position du Ministère de la nature de la Fédération de Russie, empêchant la tenue de la dépopulation de sangliers dans des zones

menacées, a conduit non seulement à la diffusion, mais aussi à la solidité de l'agent pathogène à la faune de notre pays. Un autre facteur qui contribue à la propagation de la maladie, de façon significative est le nombre des fermes individuelles, n'ayant pas le même niveau élémentaire de protection.

La stratégie de la lutte contre la propagation du virus doit être fondée sur un ensemble d'activités. À l'heure actuelle des mesures de la lutte sont construites sur la détection des infections (virus ou des anticorps spécifiques) à l'aide des techniques de laboratoires, l'élimination de tous les porcs dans le foyer de la peste africaine, la désinfection, l'isolation, et la délimitation des zones menacées (1 – 5 à 20 km, 2 – jusqu'à 150 km). Le développement des mesures visant à l'amélioration de l'efficacité des activités des services vétérinaires au niveau législatif a eu lieu. Pour ce but, le service Fédéral de contrôle vétérinaire et phytosanitaire a élaboré une série de propositions:

- élaborer et confirmer un programme fédéral de destination de la lutte contre la peste porcine africaine, qui prévoit un financement adéquat;

- élaborer et confirmer les règles du traitement des porcs dans les différents types d'exploitations, prévoyant une assurance obligatoire des animaux et de la restriction du nombre de porcs aux fermes individuelles;

- compléter le Code Civil d'une norme, permettant en cas de constatation de violations de la législation de la médecine vétérinaire ne pas verser des indemnités aux propriétaires des animaux et des produits animales;

- introduire les modifications aux règlements régissant le respect des chasseurs des règles et des normes vétérinaires, le but desquels est la propagation du virus de la peste porcine africaine;

- fixer aux collectivités locales le pouvoir de mettre en œuvre le contrôle en compte et l'identification des animaux dans les petites exploitations agricoles, et aussi le contenu et le contrôle de l'état des lieux d'élimination des déchets biologiques;

- affecter un certain nombre de mesures d'épizootie au maintien des populations des animaux sauvages sous la direction du Ministère de l'agriculture;

- augmenter la responsabilité pour violation de la législation de la Fédération de Russie dans le domaine de la médecine vétérinaire;

-introduire un système électronique de délivrance des documents vétérinaires d'accompagnement.

En outre, les principaux experts du problème de la peste porcine africaine soulignent que le principe important dans la lutte contre la peste porcine africaine et d'autres maladies des animaux est la découverte maximale, qui aidera à former le climat de confiance nécessaire pour coordonner les actions de tous les pays intéressés par l'élimination de la maladie.

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THE USE OF EXTRUDED DIETS FOR QUAIL FATTEN- ING

Аннотация: В современных условиях ведения животноводства важное значение приобретает экономное расходование зерна, направляемого на фуражные цели. Наиболее рационально фуражное зерно используется в виде комбикормов, сбалансированных по протеину, аминокислотам и др. биологически активным веществам.

Ключевые слова: экструдированные корма, перепела, откорм, соя, комбикорм, витаминно – минеральная добавка.

Fodder balanced by nutrients in the diets of animal allows increasing the productivity of animals by 10-12%, and at concentration

of biologically active substances (amino acids, trace elements, antibiotics, etc.) its productivity increases by 25-30% and more. The mixed fodder is a complex homogeneous mixture of forage resources (grain, bran, animal fodder, mineral supplements, etc.) balanced with each other.

Complete mixed fodder, contains all the necessary nutrients providing the physiological needs of animals at their high level of productivity and cost reduction of nutrients per unit of output.

Concentrated mixed fodder designed to be fed to animals in concentrate. Fish oil is derived from cod liver, adding concentrates of vitamins A and D. yeast, containing vitamins D2 and B by irradiation of ultraviolet rays, produced yeast slurry.

Especially effective is the use of extruded fodder in the poultry industry. Consider the example of extruded soybeans. Soy is well absorbed by all kinds of birds; it contains fat, in which 50% is linoleic acid, which in turn improves metabolic processes, maintains fatness and weight of carcasses. Mixed fodder in poultry has some special features. The main component is the ratio of protein and energy value. It is important to note that in the fodders with a high protein content, which is sorely needed in birds breeding, the energy level of the fodder should not exceed the required limit. If the energy content is too high, the consumption rate will decrease and there will be shortage of protein that will not allow realizing the genetic potential of the birds. On the other hand, if the fodder with high protein content will have too low energy, it will burn protein for energy production. To ensure normal functioning and high performance of calves breeding should receive in the diet. To obtain the not only a sufficient amount of protein, but certain content and ratio of essential amino acids, balanced diets on amino it is necessary to include complete fodder of animal origin and synthetic amino acids its composition. Positive effect is also achieved by adding extruded corn and barley into the fodder. However the best results are achieved using policomponentnaya extruded fodder. In the diets of quail of the extrudate for the balance of metabolizable energy and linoleic acid is suitable (6-7%). Created on the basis of extruded soybean dietary supplement for quail to the standard input of 8% allows solving the problems of the diet for the balance of amino acids, energy, micro - and macroelements and reducing the cost of the diet by 5-12%. The share of the extruded soybeans in placer

fodder should not exceed 30%. By increasing the level of input granulation is necessary. In feeding turkeys and other large birds at the early stages of their growth (7-8 weeks) safe level input of the extruded soybean forage is up to 10%, at later stages of development it is to 20% by fodder weight.

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THE EFFICIENCY OF BIOFODDER APPLICATION FOR QUAILS FATTENING.

Аннотация: Рост производства продукции животноводства значительно сдерживается из-за высокой себестоимости кормов и недостатка кормового протеина. В связи с этим большое значение приобретает изыскание новых кормовых ресурсов, богатых белковой составляющей и способных удешевить комбикорм. Поэтому во многих экономически развитых странах проводятся интенсивные исследования по решению проблемы дефицита кормового белка, направленные, в первую очередь, на рациональное использование в кормах вторичных ресурсов пищевых производств.

Ключевые слова: кормление перепелов, биокорм, боенские отходы.

The purpose of the research was to study the productivity of quails when included in the composition fodder plant and animal

origin with the use of special technologies "dry extrusion" that reduce the process of fodder preparation and reduce the loss of nutrients. Fodder was made from grains, cereals and confectionery waste, cottonseed meal with the addition of slaughter waste to the vegetable components in a ratio of 3-5:1. The produced biofodder is close to grain cereals (wheat, barley, corn) by energy density. Protein contents exceeds and is close to pea grain it also contains quite a lot of fat (7.8 %), calcium and phosphorus (1.7 to 1.3 percent), and the concentration of the limiting amino acids, lysine, methionine, threonine in it is similar to some types of cakes and meal.

Fodder efficiency in the animal diets was tested in conditions of public corporation "Voronezh quail farm" on Estonian quail breed.

For carrying out the scientific and economic experiment were formed on the principle of analogues of 40 days (control and experimental) 400 animals each 2 groups quails at the age. Birds of the control group received feed used on the farm. The biofodder was introduced to the experimental group in the amount of 15 %.

Fodder nutritional value of the control group was slightly below the normal level by metabolizable energy and protein content, amino acids lysine methionine with cystine and sodium and copper. The level of crude fiber was higher than normal (5.91 %). Introduction to the experimental group of biofodder allowed protein content to bring up to the standard and reduce the deficit lysine, methionine with cystine, threonine, and glycine, increase the content of arginine in the diet.

At the beginning of the experiment the weight of quails of the control and experimental groups differed slightly and averaged 153 G. During the first 8 days on feeding the average daily gain of calves in the control group was 0.85 g, and in the experimental - to 1.1 G.

At the age of 56 days quail group weight increased averagely to 6.9 g and amounted 165.4 g, the experimental group mass increased to 8.7 g. As a result, average daily gains at quail of the experimental group were 26.1% higher than in the control.

At the age of 64 days, the weight of the birds of the control group amounted to 170.5 g, and in the experimental one it was 6 g

higher. The increase of the quails of the experimental group was 22.3 g for the period of the experiment, which was 18.7% higher than in the control.

At the end of the experiment a control slaughter for 15 goals from each group was conducted.

As a result of slaughter and meat research the following data were obtained. The proportion of edible parts was 1.5% higher in animals of the experimental group. The birds treated with the experimental fodder were also 7.3% higher in the mass of the most valuable types of meat, i.e. the pectoral muscles.

Therefore, the test sample fodder introduction contributed to the intensive growth of the quails and the percentage increase of the edible parts of the carcass, the mass of the pectoralis muscle including.

The cost of fodder for one quail fattening was similar in both groups and was 480 g. The cost of 1 kg of the fodder of the control group was 12.38 rubles, the experimental – 13.05 rubles, i.e. it increased by 0.67 rubles. At the same cost of fodder per 1 head its costs per 1 kg in the experimental group decreased by 4 kg by the gain increase of the that group quails. So even at the increased the of cost fodder per 1 animal in the experimental group to 0.32 rubles, the cost of the fodder consumed per 1 kg of gain was 35.12 rubles lower than in the control group.

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PROBIOTICS. WHAT THEY ARE AND WHAT THEY CAN GIVE

Аннотация: Современное свиноводство имеет множество проблем с заболеваниями репродуктивной системы. Ученые всего мира ищут ответы на вопрос: «Чем лечить и как профилактировать?» Одно из новых решений - это использовать пробиотики.

Ключевые слова: пробиотики, дисбактериоз, бактерии, репродуктивная система, эндометрит.

Dysbiosis is a change in the qualitative and quantitative composition of microflora that inhabit in normal organs, which are connected with the external environment (mouth cavity, stomach, intestines, upper respiratory tract, urogenital system, etc) as well as the skin of the animal. Under the influence of various factors with dysbiosis, gut microflora, which is characteristic of this organ in good condition, decreases or disappears completely, and another atypical for this body microflora develops to replace it. Microflora which is typical for any organ that exists in a healthy organism for a long period of time performs a number of functions; one of the main is protective. Its «native» microflora protects the organ in which it lives from penetration and reproduction of pathogenic or conditionally pathogenic microbes. The normal microflora is involved in many processes in the body in particular in the biosynthesis of certain vitamins.

Representatives of the normal microflora exist at a certain interaction with each other and the environment. For example, a newborn piglet is actually sterile when he place in the external environment and in a short period of time he aquires the microflora which is typical for this animal. Future animal microflora depends on surrounding animal microflora and its immune status. The mechanism of change the normal microflora has not been fully studied yet, but it is believed that the

change in the immune status of the animal entails the changes of the normal microflora.

Stresses, environmental background, various diseases, use of certain medications contribute to the emergence of dysbiosis. For example, antibiotics often destroy sensitive to this medication normal microflora, it is replaced with uncharacteristic for the organism pathogenic microflora, that is resistant to antibiotics, such as fungi, *Proteus*, *Staphylococcus*, *Pseudomonas aeruginosa*, e.t.r. The speed of adaptations of bacteria to antibiotics is much faster than the rate of production of new drugs, that is why antibiotic therapy is often ineffective in the treatment of diseases in pigs. As a result, complication may develop, sometime much heavier than the former disease. In the intestine of the animal basically live lactic acid bacteria and bifidobacteria, which protect the body from ingress of various pathogens causing gastrointestinal disorder. While there are enough «protective» bacteria in the intestine, they steadfastly resist the intrusion of strangers, but if for some reason these bacteria become less, immediately different types of *E. coli*, *Salmonella* and other pathogenic bacteria substitute in their place. The activity of the remaining normal microflora immediately violated it is protective function disappears, synthesis of vitamins stops, which drastically impairs the body's resistance to harmful bacteria and reduces the resistance to adverse environmental factors. The most common cause of dysbiosis is overreliance veterinarians and animal owners treatment by antibiotics, that can cause animal to significant harm in the event of failure of some of the peculiarities of their application.

Nowadays the problem of dysbiosis gastrointestinal tract in young animal is very relevant. A lot of researches and experiments are being conducted. Modern science is looking for methods of the least use of antimicrobial drugs and appeals more to the help of live bacteria. Diarrhea in piglets in the pig farming brings economic harm such as: reduced weight gain, increased mortality of young animal. It is true, that healthy pigs can be obtained only from healthy sows. Diseases of the reproductive system of breeding stock are at least a topic of the day. Metritis, mastitis, especially in the latent form is also a serious problem in modern pig production.

Latent endometritis is chronic inflammation of the uterus, occurring without apparent clinical signs. These animals have no sharp deviations from the norm in the clinical condition. Body temperature is

in the range of 38.7-39.4 °C, appetite is satisfactory, there is no vaginal discharge. Latent endometritis can be recognized only during estrus by an increased amount of mucus, which sometimes contains flakes of pus released from the outer genital slit. Besides, one of the signs can be repeated unsuccessful insemination of pigs. In these diseases the productivity of breeding stock is inhibited, the service period is lengthened, because there is no timely insemination, which is economically disadvantageous.

In recent years, new approaches to the treatment of dysbacteriosis are appearing, based on restoring the natural microflora of the body with the help of biologically active products of probiotics. These microbial products include stabilize culture of microorganisms, which has antagonistic activity against pathogenic microflora. For efficiency probiotics are not inferior to some antibiotics and chemotherapeutic drugs. Besides, they do not have a harmful effect on the microflora of the digestive tract, do not contaminate animal products and therefore they are safe for people consuming them, do not pollute the environment. Probiotics do not only normalize the qualitative and quantitative composition of the intestinal microflora after the use of antibiotics, but in many cases they may be the only effective method of treatment, prevention and stimulate the productivity of pigs. Nowadays new forms of probiotic preparations and alternatives to antibiotics are being sought, which are relevant modern requirements of agricultural production.

Modern pig production steps into a new era. In the past are antibiotics that kill the microorganisms. In the future the fight against disease will be through its own resistance and this means that the medicinal product must also meet the new standards. Humanity wants to consume environmentally friendly products. Antibiotics used to treat animals, whose meat is eaten, may cause decreased effectiveness of antibiotics used to treat humans, and cause pathological processes, such as allergic reactions. Our goal is to study the effect of probiotic preparations for the prevention of disease of the reproductive system of sows, which occur in a latent form, not manifesting clinically. It is necessary to understand how effective this solution is and also how economically profitable. Pig farming is a business and our task is to provide conditions for its prosperity.

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THE HEALTH AND REPRODUCTIVE FUNCTIONS HORSES ORLOV TROTTERS

Аннотация: В настоящее время условия для существования современного спортивного коневодства достаточно малы. Представлять интересы страны на соревнования мирового уровня становится все сложнее. Многие отечественные породы просто исчезают, большинство конезаводов не может составить конкуренцию на мировом рынке, и приходят в негодность. Самая русская порода лошадей – это орловский рысак. Универсальный по всем своим показателям и характеристикам.

Ключевые слова: Орловский рысак, воспроизводство, молодняк, работоспособность, БАД, функции.

Once the most numerous breed in the country, currently Orlov Trotter breed is small in number and (according to the criteria FAO) has the status of breeds that are endangered. At the moment the number of breeding core of the breed in Russia is less than 500 head of purebred ewes and about 50 head of purebred stallions. This volume breeding core is considered to be insufficient for intensive breeding for complex traits.

Researchers from the Ryazan Institute of horse breeding indicate that along with the reduction of livestock Orlov trotters associated with the economic crisis in the country and the critical state of the majority of studs, in the rock decreases the level of reproduction (G. V. Kalinkin, 2001; O. A. Kosarev, 2002; G. A. Christmas, 2003, etc.). Taking into consideration on this state of affairs, one can see that most of the old proven mares can't be used in the reproduction due to poor sagaramati and lack of funding.

The low abundance and, therefore, a limited gene pool and the low level of reproduction in the breed jeopardize the continued exist-

ence and improvement of the Orlov trotters, as the Orlov Trotter breeding involves only pure-bred breeding. The purpose of this research is to increase reproductive functions of Orlov trotter horses with the use in the diets of the BAD Mega Base fertility. The increase the percentage of successful mating and insemination can be developed by dietary SUPPLEMENTS. In this paper, we will use company Equistro Mega Base fertility" Feed additive designed specifically for breeding mares. It satisfies higher requirement of calcium and essential minerals. Such elements as zinc, copper, vitamin E, vitamin A and carotene support the best. Trace elements are presented in organic form, which provides better bioavailability and their distribution in the body of the horse. Created for daily use, EQUISTRO MEGA BASE FERTILITY supports maximum fertility and optimal development of the fetus. If contains all the nutrients needed to balance the traditional diet. Due to the fact that all trace elements are in organic form, bioavailability and absorption of the mineral composition of Bud for pregnant mares and mares during prislusneho and slucero season increase. The experimental part of this work was designed for rational use of this additive with the most optimal timing of feeding mineral, namelythese:

- prislusnou period (2 weeks before slucero season)
- 4 - 5 months, meaning (given the initial stage of fetal development)
- a month before vegeable (enriching the body of a Mare - mother and bridging mineral skeleton of the unborn foal) Approving the form and scheme of feeding more cost-efficient use of this Dietary supliment, which will allow by to increase the fruitful result of mating.

Consider that Orlov Trotter horse is not precocious. One of the indicators that will be considered in this paper is the difference in the resulting foal performance. Periods of growth, precocity (the use of supplements) will allow observing the difference in the growth and health of calves and the health of young Orlov Trotter. Thus, the results of this work will provide their more efficient and long-term use

in the reproduction of Orlov trotters horses to increase their reproductive function and produce more healthy and hardy foals.

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CURRENT TRENDS IN BREEDING OF FALCONS

Аннотация: В работе описана современная ситуация в разведении соколов и выделены актуальные направления в его развитии.

Ключевые слова: сокол, сапсан, балобан, кречет, разведение, селекция.

Main Russian hunting birds are large falcons - gyrfalcon (*Falco rusticolus*), peregrine falcon (*Falco peregrines*) and saker falcon (*Falco cherrug*). Now the peregrine and saker falcon are listed in the Red Book of Russia as endangered species.

Falconry in Europe and Russia was very popular in the Middle Ages and Modern Times. Birds of prey were not able to breed in captivity, eyases or adult birds were caught and by a special technique tamed to the human and trained for hunting. Falcons, hawks and large birds such as eagles were used in falconry.

In Europe and Russia falconry has lost popularity with the spread of sporting guns, and by the 20th century it has remained a pas-

sion of individuals. Birds of prey were massively exterminated as wreckers of agriculture, their number has become less due to power line construction and use of pesticides. By 1960s measures for their protection have become urgent [5; 8].

In 1970s and 1980s the breeding birds of prey in captivity became possible in zoos. It formed the basis for projects of reintroduction of peregrine and saker falcon to the wild to maintain an acceptable number.

In late 1980s the interest in falconry has been renewed in the USSR. Falconry nurseries were established [4; 6; 7].

In early 1970s birds of prey started be used as biorepelents - i.e. to destroy birds that could collide with the aircraft and cause a catastrophe on the airfields, and on agricultural sites, the birds of prey destroy wreckers, such as the crows. In the 1970s the reconstruction of the Kremlin in Moscow took place, but soon there was a problem - the local crows liked sliding down the domes of the Kremlin cathedrals, scratching gold foil with claws. They were not afraid of scarecrows, sirens and blank ammunition firing. The crows have remembered and ignored houses-traps with bait, where it was impossible to get out from. Before the Olympics-80 the solution was found - Falconer service of the Moscow Kremlin was formed, in Taynitsky Garden there were installed aviaries with gyrfalcons and sakers, which were trained for the extermination of crows. The service still exists. In late 1980s testing the use of birds of prey as biorepelents at the airports began, at Kubinka, Moscow region, for example [2; 4].

Poaching of birds of prey, mainly falcons, radically increased in the early 1990s because of the open borders. They were used selling abroad, mostly in Arab countries, where falconry was always considered to be popular and prestigious, but breeding of falcons is problematic due to the climate. Breeding of falcons in captivity and export selling them at a fixed price, and the sale on the domestic market became necessary in the struggle against poaching.

These are four main reasons for falcons breeding in captivity.

Breeding of falcons with the best hunting qualities started in falconry nurseries. That is specific to the fact that gyrfalcon, peregrine and saker falcon freely hybridize each other. Similar activities are being developed both in Europe and USA [1; 3; 7]

But zootechnical principles in breeding of falcons are not applied sufficiently. Hybridization of the best with the best is commonly used.

Methods of recording good and bad qualities of falcons are not developed properly. In Russia we proposed first tribal card for the falcons at 2013. Little known is the specificity of inheritance of good and bad qualities of falcons. Little studied is the inheritance of such important commercial trait falcons as color. Most valued is the white falcons, and the consumers - the Arabs do not like to buy light falcons with a dark spot on the back, which they call "the spot of Satan".

It should be noted that in nurseries artificial insemination and incubation of eggs for breeding of falcons is used.

Accordingly, current trends in breeding of falcons in Russia are the following:

- 1) study of interspecific hybridization of falcons and assessment of its prospects;

- 2) identifying the best lines and families of breeding among falcons at Russian nurseries and purposeful breeding work.

This requires:

- 1) zootechnical analysis of the growth and development of the Gyrfalcon, the Peregrine falcon, the Saker falcon and their hybrids;

- 2) evaluation of productive and reproductive qualities of falcons-producers;

- 3) evaluation of the productive and reproductive qualities of falcons-producers and the study of the inheritance of such qualities;

- 4) collection and analysis of information about falcons of Russian nurseries, assessment of their qualities and their potential as producers;

- 5) evaluation of the effect of feeding and keeping conditions on the growth, development, productive and reproductive qualities of falcons. In the future this will facilitate the incubation of falcon eggs and reduce the mortality of the eyases;

- 6) charting the scheme for obtaining hybrids with good productive and reproductive qualities.

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ANALYSIS OF BIOCHEMICAL STATUS OF IMPORT BREEDING CATTLE.

Dairy farming is the major industry of agro-industrial complex of the country to ensure food security and improve the living standards of the population. Its share price in relation to the total livestock

output is 29%, the industry employs more than 1 million people. The volume of milk production Russia ranks third in the world.

According to the Federal Center for Animal Health the research, high-yielding cows are most often eliminated from the herd in connection with the defeat of the extremities (21.2-24.3%), metabolic disorders (22-22.9%), of the digestive system disease (14-14.5%), reproduction (8.8-13.9%) and mastitis (6.5%).

Intensive industrial technology creates great difficulties that are associated with maintenance of normal physiological state of the animals, as high yielding cows with intensive metabolism react even to minor violations of the terms of feeding and housing [2, 3, 4].

To maintain high productivity cows are fed with large amount of concentrates, which leads to the development of rumen acidosis, ketosis, reduce resistance reduction and deterioration in reproduction [6,7].

In 2005-2013 within the framework of the national project for the development of agro-industrial complex of the country more than 18 thousand cows of milk and meat lines from Europe (Austria, Germany, Holland, Hungary, Australia, Canada and the USA, were brought to Lipetsk region.

One of the main obstacles to the effective management of dairy cattle is profound metabolic disorders [5].

Analysis of the results of biochemical studies of cattle blood imported from different countries to metabolic changes in animals after the importation to the farm, and during the stock keeping.

Metabolic disorders were registered in 8-42% of the animals, in further aggravated and was noted in 40-64%, largely negative trend was observed in the state of the protein and carbohydrate metabolism, as well as in the functional status of the liver.

For biochemical analysis blood serum of cows is marked by profound metabolic abnormalities that progressed after adaptation: during the period of quarantine at 10%, after adaptation - 57% of the animals. This indicates unsatisfactory conditions of keeping and feeding animals in the farms.

After importation to the farm separate heifers had already problems with limbs. The main reason for these phenomena is a stress factor in the period of transportation and quarantine [1, 8].

In the future depending on the conditions of feeding and maintenance in a specific sector, biochemical disorders progressed to varying degrees, but according to the same scheme. First, the content of total protein in blood increased (39%), concentration of urea increased after

birth due to the lack of energy in the diet. Ketone content of bodies in serum does not exceed 10 mg/%.

The main reason of biochemical disorders in the imported animals was inability to create conditions close to those on the farms abroad.

Thus biochemical studies have shown that the disruption of metabolic processes in imported cattle starts during transportation and quarantine. After importation to the farm conditions are not always optimal for the animals: premises and forage are not prepared. All this adversely affects the process of the animals' adaptation. After birth, the main cause of metabolic disorders is unbalanced feeding: lack of dry matter, structural fiber disorder of energy and protein, lack of vitamins and minerals in the diets.

For the prevention of the diseases associated with unbalanced diets, constant monitoring of the feeding is required process. We exercised zootechnical fodder analysis.

Biochemical indicators of blood, to detect the imbalance of metabolism in the body, is associated with disruption of feeding ruminants at an early stage were defined.

The system of veterinary measures should be aimed at the improvement of feeding due to the introduction of complex additives for highly productive cows with the regard to biochemical studies and animals immune status the improvement.

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THE RESULTS OF THE VETERINARY-SANITARY EXAMINATION OF FISH FARMS OF LIPETSK REGION

Аннотация: В статье приведены результаты ветеринарно-санитарной оценки искусственных водоёмов рыбоводческих хозяйств Липецкой области с учётом общих требований к воде.

Ключевые слова: рыбоводческие хозяйства, искусственные водоёмы, ветеринарно-санитарная оценка.

Good nutrition of the population is a factor of its health. Essential element of power is a product of aquaculture. In 2012, the production of marine fish in the world amounted to 40.4 million tons. Leaders in this field are Peru – 8.3 million tons, China - 5.1 million tons and Chile - 3.7 million tons. Russia in this category of fish has modest 0.9 million tons. The global marine fish catch in 2012 was 19.76 million tons, including the share of China 2.92 million tons, USA – 2.30 million tons, Russia - 1.82 million tons. These figures clearly demonstrate that the Russian Federation, which is one of the densely populated countries and which has extensive marine and oceanic territories, is not among the leaders in production of fish of different categories. This requires the shortfall, including through the development of freshwater fish farming within the country [2, 5].

It should be noted that in this country in recent years there has been dynamic growth of the industry, especially in the Central and northwestern Federal districts. Russia can turn freshwater aquaculture in the industry that will make a significant contribution to food production [4].

During the research we studied the statistical reporting of CJSC ACE "Lipetsk Fish Industry" conducted veterinary-sanitary monitoring of water objects of the Lipetsk region, determined the main diseases of fish. Laboratory studies were conducted on the basis of Lipetsk regional veterinary laboratory.

The study used an integrated approach that includes veterinary-sanitary and pathological-anatomical studies. Raw fish was used as the material for the study. We investigated 25 fish samples in 15 days interval. The research was started with clinical examination. Then filmed mucus from the individual sections of the carcass (fins, gills, nasal fossa) was taken and placed on a glass slide. When opened up fish was cut along the midline, from anus to the posterior edge of the mouth slit. In order to expose the internal organs lying in the body cavity, we cut the sidewall. Internal organs we examined by the naked eye. Pieces of liver, spleen, swim bladder peritoneum were observed under a microscope [1, 3].

Veterinary-sanitary examination of muscle tissue was done after incision parallel to the spine and after cutting out pieces of muscles at different depth from dorsal and caudal parts of the carcass. Digital material of the research results were processed with the help of spreadsheets Microsoft Excel 2010 on a personal computer.

In Lipetsk region major the most widespread objects of pond culture is carp. The objects of fishing on the territory of Lipetsk region are silver carp, grass carp, perch, pike, carp, tench. Fish originate from Dobrovský zonal hatchery - 80%, Belgorod region - 10%, Tula and Voronezh regions - 5%.

For carrying out veterinary-sanitary expertise fish were sent to the regional veterinary laboratory accompanied by the corresponding documents. All laboratory samples were examined. Pay attention to the fish appearance, its color, condition of the scales and mucus, as well as the fins, the color of the gills, eyes, abdomen, texture of muscle tissue, the smell in the gills and anus.

As results of organoleptic studies 100% of the fish were characterized as benign. Physico-chemical studies classify all the fish as be-

nign and microbiological parameters are within the safe fish use without restrictions.

During the reporting period, we established the existence of certain regularities, namely: most susceptible to parasitic diseases were carp, up to 80% of households cultivating this fish had problems on certain diseases. Swim bladder (87,45%) and gill disease of uncertain etiology (89,33%) were the most common. The most favorable situation for parasitic diseases was formed on white amur. This fish species was completely free of pathologies in the number of farms.

In conclusion it should be noted that the total percentage of parasitic diseases was equal to 17.53%. Gill disease of uncertain etiology (95.21%) dominated by such pathology. Carp, perch and pike were the best samples in the system of the fish farms. Artificial aquaculture has beneficial effects on parasitological security. Isolated cases of gill diseases on unknown etiology were registered on the fish farms.

The analysis of fish farms of different ownership forms showed that the worst situation is in enterprises of Griazinsky and Dobrinsky districts. The most effective from the point of view of preventing the development of invasive diseases were Usman and Lipetsk districts.

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***Секция V. Научно-техническое обеспечение технологии
производства и товароведения сельскохозяйственной
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***Section V. Scientific and technical support of agricultural
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**DEVELOPMENT OF THE METHODS FOR
PRODUCTION AND APPLICATION OF NATURAL
FOOD COLORINGS FROM THE LEAVES OF AMARANTH
VALENTINE VARIETY**

Аннотация: Разработаны параметры способа получения пищевых красителей из листовой массы амаранта сорта Валентина. Исследовано влияние различных факторов на эффективность процесса экстрагирования амарантина и хлорофилла из сырьевого источника. Рассмотрены факторы, влияющие на сохранность свойств красителей. Разработаны рецептуры карамели, зефира с применением водно-спиртового и спиртового экстракта амаранта в качестве натурального пищевого красителя.

Ключевые слова: амарант сорта Валентина, экстракция, натуральные пищевые красители, кондитерские изделия

One of the most popular uses of food colorings is the confectionery industry. Traditional dyes are included in virtually all types of sugar confectionery: caramel, pastila and marmalade products, chewing gum, as well as cream and other. In view of the increasing trend towards the consumer healthy food, products with natural dyes are

more in demand today. Therefore, research on the development of food dyes of natural origin in confectionery products are the current direction for the development of the consumer market. It is also due to the need to solve the problem of import substitution. Typically food colorings are ingredients of foreign production. [1]

Varieties of amaranth selection are chosen in the study as a source of dye and bioactive substances of the Russian research institute of vegetable breeding and seed production (Prof. V.K. Gins, P.F. Kononkov) 2013 year. [2] Food coloring is red pigment extraction leaf Valentine-betacianina amaranth cultivars mass. To justify the parameters of the methods of the dye production a number of factors influence was studied:

- the grain-size composition of amaranth leaf mass;
- process temperature;
- the duration of the process;
- hydro-module;
- nature of an extragent.

In the first series of the experiments the process of obtaining water and water-alcohol extract was. Dried leaf mass of amaranth was crushed to various sized particles. Measurement of optical density in the extract solutions was conducted breeding 1:10. The results obtained confirmed that the reduction of size at of leaf amaranth mass distribution leads to the increase in optical density of the extract and thus to the increase of the process efficiency. [3]

Bearing in mind the need to preserve biologically active substances of amaranth, and the need to reduce the energy intensity the extraction temperature influences optical density was studied. In the experiment amaranth leaf mass was crushed to the particles size less than 0.3 mm. The temperature changed from 30 up to 50° C.

Thus, to get the food coloring of red-cherry color previously dried Valentine amaranth variety leaf mass was crushed to the particle sizes less than 0.315 micrometers, mixed with extragent - water-alcohol solution containing alcohol of 40% vol. at a ratio of 1:10 and was kept in a water bath at 50° C for 50 min and centrifuged for 8 minutes.

The study was also found that with alcohol extraction of the same raw material the dye can be of green color. The experiments justified the following parameters to produce green food coloring: grinding dried leaf mass Valentine amaranth variety to particle size less

than 0.315 mm, hydro kit 1:8, extragent-rectified ethyl alcohol, the temperature being 50° C, at 60 min duration.

From the point of view of the prospects pH use of further the influence on the color of the water-alcohol and alcoholic extracts of amaranth was investigated. Color changes were recorded visually. The studies have shown that water-alcohol extract is stable in acidic environment and fully preserves the color at pH of 2.0. Alcohol extract has a steady green color in the pH range of 5.9 -12.5. Subsequent developments showed that chlorophyll in acidic medium is unstable, dirty-brown-green tone.

It should be noted that the development of new food ingredients includes such an important aspect as the persistence properties. To define the parameters and conditions of water-alcohol and alcoholic extracts storage of amaranth we investigated the changes in their optical density during storage at $4 \pm 2^{\circ}\text{C}$, $22 \pm 2^{\circ}\text{C}$ in a container of light and dark glass.

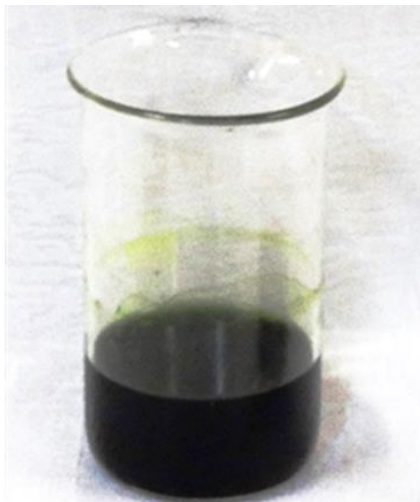
Based on the data it was proved that light has a greater impact on the loss of color intensity of water-alcohol extract compared with the temperature. That is probably due to oxidation processes amaranth betacyanina, because of the large number of double bonds. Alcoholic extract during storage is more resistant to the effects of light and temperature compared with water-alcoholic one. Perhaps it depends on the resistance to the light contained in the extract hlofillina-derived chlorophyll and slower oxidative processes by ethyl alcohol. Alcoholic extract of amaranth in contrast to water and water-alcohol does not lose intensity, and changes it especially under the influence of temperature, in the direction to olive then dirty yellow-brown due to formation of feofitin.

The research unit has recommended water-alcohol extract for amaranth leaf mass storing in a dark glass container for a period of not more than 3 weeks at $4 \pm 2^{\circ}\text{C}$.

For food coloring obtained by alcohol extraction of chlorophyll from the leaves, guaranteed retention period is 30 days in a dark container at a temperature of $4 \pm 2^{\circ}\text{C}$.

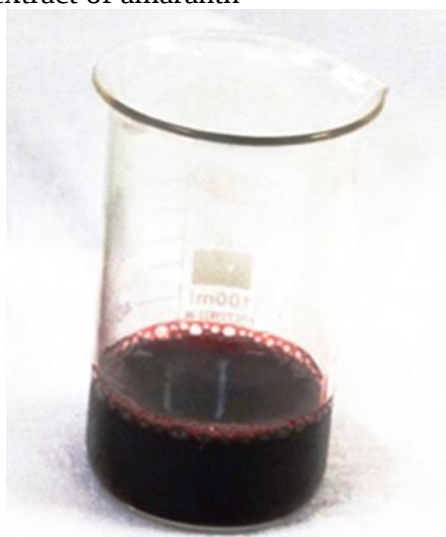
The alcoholic extract is a rich green color transparent liquid with pH 5.9 (fig. 1). The extract has a steady green color in the range of pH 5.9 -12.5. For its use as a natural dye of sugar confectionery and pastry finishing products it advisable to separate it from acids and acidity regulators at lower temperature parameters.

Figure 1- Acohol extract of amaranth



Water-alcohol extract is a transparent liquid of saturated cherry-red color with a slight grassy smell with a solids content of 12 % and pH of 5.8 (Fig.2). It has stable color characteristics in the range of pH from 1.8 to 12.0. Based on all its properties in the future it can be used as a natural dye for food products, confectionery including.

Figure 2- Water-alcohol extract of amaranth



During the further studies of water-alcoholic and alcoholic extracts were added as food dyes in marshmallows and caramel mass to increase the products quality.

The recipe for marshmallow "Vanilla new" and two recipes for caramel "Crimson joy" and "Apple health" with natural dyes from leaves of amaranth were developed. A pilot batch of marshmallow with natural amaranth food dye within 35 days the quality indicators at the level of the national standard requirements Marshmallow "Va-

nilla new" (Fig.3) should be stored in packaging that protects it from exposure to light.

Figure 3- Marshmallow "Vanilla new"



Caramel with amaranth water-alcohol adding extract gets a nice crimson color, with amaranth alcoholic extract it gets green color (Fig.4). It has a round shape, smooth, non-sticky surface, pleasant slightly sour sweet taste. All physico-chemical parameters correspond to the requirements of the national standard.

Figure 4- Caramel "Crimson joy" and "Apple health"



With regard to the content of biologically active substances in amaranth leaf mass the increased physiological product value it can be assumed. Recipe of marshmallow "Vanilla new", caramel "Apple health" and "Crimson joy" are approved in the prescribed way and can be taken as the basis for the development of technical specifications for new products. The developed recipe and modified technology parameters of pastila and caramel products confirmed the appropriateness of food coloring amaranth application.

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THE DEVELOPMENT OF THE DAIRY CLUSTER IN CONDITIONS OF IMPORT SUBSTITUTION

Аннотация: Авторы рассматривают проблему импортозамещения молочной продукции и пути их решения. В статье представлен анализ молочного комплекса Воронежской области в условиях интенсивных технологий. Показаны племенные ресурсы и генетические возможности разных пород. Рассмотрены пути развития производства молока – сырья в условиях молочного кластера.

Ключевые слова: импортозамещение, молочное скотоводство, порода, молоко-сырье, качество, технологические свойства.

The problem of import substitution and national security is especially relevant today.

Unfortunately it is recognized that the achievement of the indicators of food security Doctrine and targets of the state program on milk production is impossible due to the objective reasons [1].

In the current political and economic situation, the task of import substitution, in the first place must be solved in dairy industry, which products are in demand by all segments of the population.

Traditionally Voronezh region occupying the leading position in the country on the development of agriculture continues to increase capacity in livestock, despite the crisis. By the end of 2014, the region occupied the second place in Russia the first in this region by the increase of the cattle number (Table1). Other areas of the Central Chernozem region try to maintain livestock on the level of the last year.

Table1. - Number of cattle in the agricultural organizations of areas in the Central Chernozem region (thousand heads)

Region	2013	2014	%
Voronezh	266,5	280,8	105,4
Tambov	30,8	32,7	106,1
Belgorod	157,6	156,1	99,0
Lipetsk	74,9	73,3	97,9
Orel	85,3	80,2	94,0
Kursk	101,2	93,4	92,3

The increase in the number of cattle in the economic crisis was largely due to the successful development of meat and dairy clusters in the region. The direction of agriculture development in modern conditions is the increase of beef herd. Milk production is expected to be increased due to the increase of milk productivity of cows.

The problem of raw material for the dairy industry is very urgent. Especially scarce is the highest grade milk. Today Voronezh region is one of the largest milk producers in the Russian Federation. The significant potential of the region and proper attention to the development of dairy farming, food processing industry contributed not only a period of stabilization, but the increase of number of cows, increased milk production and gross production of milk. By the end of 2014 there was the increase of milk production in Voronezh region. Gross production in agricultural enterprises grew up to 441205 tons (109% compared to 2013). The productivity of the dairy herd is close to 6 thousands.

Despite the dynamic development of the dairy industry, its potential is not fully realized, because the capacity of the processing enterprises in the dairy sector only 56% is involved.

Intensive development raw milk production of and its processing today are on the way of unification and coordination of organizational resources of all those involved in the industry In Voronezh region. The model of the development is the creation of chains of cluster type. The establishment of the dairy cluster, strategy and the development program adopted in 2014 plans to increase the loading of the existing processing units from 56% to 85-90%.

Cluster model of economic development is chosen as a priority in the region. It's effectively implemented in the specialized beef cattle industry. It should include a full range of industries and innovative projects, providing its high competitiveness and effective functioning "from farm to product".

The value chain of the cluster is expanding with the production of raw milk, where the important point is to increase its marketability, then further processing, logistics and retail. The related activities to the chain are also includes ensuring the finished product:

- production of fodder;
- livestock breeding;
- manufacture of equipment for the dairy industry;
- veterinary services;
- transportation of raw milk and finished products;
- realization of finished products.

The process of cluster formation will occur in several stages. At the initial stage most projects and activities are aimed at the formation of a high quality and sufficient raw materials for the processors.

The process of creating high-tech industries and enterprises to the cluster in the perspective markets will be completed at the following stage (2016-2020).

The project began with the construction of mega farms in Kantemirovsky district. Animals of Montbeliard and Jersey breeds that are now the stage of adaptation were introduced milk production will be assessed for the first time.

Dairy cluster should contribute to a significant increase in milk production in the region without sharp increase of the population.

Thus milk yield in 2014 was 5545 kg per cow. By 2020 they promise to reach 7000 kg/per cow. However some manufacturers continue to increase the herd. So, in the near future it is planned to reach full capacity of complex "Molvest" in Kantemirovsky district and the construction of new facilities in Anninsky one (5000 birds). Holding "Ekonivaagro" develops Koretsky and Kamensky complexes, as well as considering building in the Liskinsky district of mega farms by 2.8 thousand. Projects are underway dairy structures in Rossosh district.

Six of the largest milk processors are based in Voronezh region today. The largest of them is the holding company "Molvest", which is the third largest dairy company in Russia in the sphere of traditional dairy products. Company "Molvest" signed an agreement with the international concern "Arla foods Artis" on joint production of cheese produced from milk in the Voronezh region. Danish company granted OJSC Dairy plant in "Voronezhsky" necessary technological designs for the production of cheese in accordance with European standards and participated in modernization of "Karachaevskiy cheese plant" by delivering technological equipment for the production of cheese. Functionality distribution will be as follows: "Molvest" is responsible for the collection and initial processing of milk, "Arla foods" - for the production of cheese Arla Natura®.

The second position in the region is occupied by LLC City milk factory "Liskinsky", specializing in the production cheese and butter. In 2009 new milk standard is completely remodeled and updated. New main production bulling for Cheddar cheese production is mounted by the company Tetra Pak/ It is designed for a complete cycle from the. The declared milk processing capacity is 350 tons per day, actual - 225 t (64,3%). Thus programs have been developed to support "cheese making" in the region. Today Voronezh region is one of the leaders in the production of cheese in the country (over 3500 tons produced in 2012)

Raw materials are the most important component in the production of dairy products. Long-term studies conducted at the Department of Private Animal Science to evaluate physico-chemical and technological properties of milk, indicate that milk obtained from cows of different breeds, in the region natural and economic conditions, is of good quality and matches the optimum values for the production of

different types of dairy products. Milk of Simmental and Red-and-White breeds cows (over 80% of the herd) is rich in calcium salts, protein, has special aroma, good coagulation, so it is an extremely valuable raw material for the production of cheese [2].

The strategy of dairy cluster development will provide an intensive development of the industry, increase profitability and investment attractiveness.

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INVESTIGATION OF FOOD CARROTS VARIETIES AND HYBRIDS FOR LONG TERM STORAGE.

Аннотация: В статье приведены исследования по изучению сортов и гибридов продовольственных корнеплодов моркови с целью их длительного хранения. При анализе сохранности корнеплодов было определено общее количество сохранившихся корнеплодов, число проросших корнеплодов, массу проростков, естественную убыль массы корнеплодов и степень подвяленности их тканей.

Ключевые слова: корнеплоды, морковь, хранение, сорта, гибриды

Vegetables occupy an important place in human life, because it is a necessary and indispensable food source, the set-GIH of vitamins, the most important supplier of potassium, calcium, and magician of iron, necessary for the human body. High is the role of vegetables in the excretion of harmful products formed in the process of digestion, as well as stimulate the glands activity involved in this process. The production of these crops can not only satisfy the human needs in a particularly valuable vegetable in the spring, summer and autumn, but also to stoke some of them in a fresh or processed form for the winter. There is a lot of data in scientific literature, on the vegetables storage in winter ensuring human needs in spring – summer period. The reflector results in the works of many researchers [1, 3].

One of the main crops, both in Russia and in almost all countries of the world, is carrot. The special value of carrots is explained by high provitamin a – carotene content. In humans and animals carotene is converted to retinol - vitamin A. The human need for vitamin A varies depending on physical activity, as well as on the meteorological conditions. The minimum daily intake of vitamin A for humans constitutes 3300 ME, which corresponds to 1 mg of pure vitamin or 2 g of carotene. Do not exceed the rate of carotene consumption, as this may develop hypervitaminosis in the form of diarrhea, loss of appetite, gipoprotrombine-mission, disturbed metabolism of ascorbic acid and others. Daily consumption of carrots in humans and animals within the daily dose of vitamin A promotes prevention of many diseases.

The objective of new varieties and hybrids breeding, modern technologies of production and processing of carrots is to provide year-round uninterrupted people and animals fresh root vegetables, and industry with materials.

In Russia, carrots are cultivated in all agricultural arcas. According to the last census of cultivated agricultural crops in Russia, it takes an average of 8.2% despite conformal PLO-cultivated vegetables. In the gross production of vegetables, its share is 8.1%; yield according to the LP-ranges are from 10.8 to 16.8 tones / ha. The highest yield of carrots achieved in Moldova - 29.4 t / ha, Latvia - 24.3 t / ha, Es Tonia - 21.1 t / ha, etc. Russia's average yield carrot is 16.3 t / ha.

Carrots are cultivated everywhere, but it takes the largest areas in Poland. In France, it covers an area of more than 40 thousand hec-

tares. In the United States - more than 30, UK - 12, Canada - 5, Japan (mostly as winter varieties) - about 20 thousand hectares. Breeding work with carrots intensively conducted abroad-WIDE selection of the company in France, the Netherlands, the United Kingdom, and research institutes, Denmark, USA, Canada and Japan. [2]

Selection of carrots in all countries is aimed at the productivity and precocity increase, improvement of a product quality, storage quality and suitability for machine harvesting. In recent years, considerable attention is paid to the improvement of carrots varieties and hybrids sustainability to diseases and pests. In France, the Netherlands and the United States carrots breeding is developing towards the creation of heterotic hybrids based on cytoplasmic male sterility.

The genus *Daucus* L carrots belongs to the family of *Apiaceae* Lindl. - (Celery). According to the natural system phylogenetic angiosperms of A.L. Takhtadzhyan plants of the celery family are not as ancient as some others, such as, Cruciferous, for instance.

Carrots are mentioned in Babylonia (now Iraq) in X. BC, as well as in the literature of ancient Greece. The term of its cultivation is more than three millennia. According to archeological data remains of ancient carrots are found in piles-governmental buildings in Switzerland. Therefore, wild plant carrots came in to human life as in the Neolithic period. In the process of mutation changes the shape and weight of root. In all species studied originally cultural forms with long roots appeared. Later, in the XVIII - XIX centuries. Mutant forms with tapered, cylindrical, elliptic roots.

Diverse genetic nature of root dyeing was found. Carrot roots accumulate carotenoid and anthocyanin. Genetic predisposition of vegetative and reproductive organs to the appearance of spectrum colors helped to strengthen root forms dyeing. Pigments, especially beta-carotene determine value feed carrots. Plants synthesize and store various kinds of carotenoids in the roots is alpha, beta, gamma, zeta-carotene, lycopene, xanthophyll, cryptoxanthin, lutein, xanthophylls esters of fatty acids and derivatives of karobone carotene-sentations. Carotenoid pigments are characterized by a system of conjugated double bonds, determining, the color from bright red to yellow. Carotene was isolated from carrot in 1831 and the specific epithet was given to *D. carota* L. It is a source of and belly-tion of vitamin A for-

mation in human body. Most of the physiological roles of carotenoids play an important part in body, they are participants in the processes of photosynthesis, fertilization, growth, and protect chlorophylls from burnout. Carrot has a complex combination of carotenoids and anthocyanins, which are inherited from generation to generation [1].

One of the main tasks facing the agricultural producers carrot roots in particular, is the storage crop during the winter-spring season without degradation both the variety and quality. However, the smooth flow of the product during the seasons is possible only a developed systems of its long-term fresh storage.

The increase of carrots safety can be achieved by of their storage conditions or physiological state regulation. Therefore, in our opinion, the search of perspective varieties and hybrids to improve the storage quality is necessary.

Developing the scheme and methods of the experience, we proceeded from the fact that the processes occurring in the roots during the storage are a continuation of the processes characteristic for the states of root crops in the pre-harvest period. It follows that the degree of activity of the factors in the internal exchange in carrots are reflected in the state of root crops storage.

Our study included the storage of carrot in a stationary store. Two ways to store were chosen: storage with sand layers, and using plastic bags of 30-35 kg and film thickness of 100 microns. As the object of investigations varieties of food and Nantes carrots Rogneda-4 and hybrids Gribovchanin, Coral and Kalgeri were chosen. Control as a Shantane variety cultivar. Storage conditions were maintained in accordance with the recommendations for this crop.

Carrots storage evaluation of was carried out in the first half of April.

Analyzing the safety of roots we determined not only the total number of the survived root crops, but also the number of germinated roots, sprouts weight as an indicator of the process intensity, the natural weight of roots and the level of slightly dried tissue.

The results of the survey of food carrot roots storage showed the difference in the safety of food carrots varieties and hybrids.

Storage of carrot in plastic bags of 30-35 kg and the film thickness of 100 microns reduces the consumption of nutrition substances

for breathing and increases their safety. This is confirmed by the analysis of preservation, presented in Table. At the option using plastic bags of 30-35 kg and a film thickness of 100 microns storage capacity was higher in all the studied varieties and hybrids. The highest one was in hybrids Kalgeri - 88.6%, sand below 10.2%, Gribovchanin - 85.8%, decreased by 8.9% and grade Rogneda - 88.2% Nantskaya 4 - 86.3%, with sand layers at 8.9 and 10.4%, lower respectively.

The quality of root crops is judged by such indicators as the number of sprouted roots. In our studies roots was observed in all the variants izrostanie. This suggests that the formation of germs on roots largely depends on unfavorable factors that occurred during the initial storage stage. The temperature 2-3°C above the planned at which roots, buds started to grow and germs were formed was kept within a month went out of.

One of the most important indicators that have a profound impact on the storage carrot roots is the degree of slight dryness. The increase the degree of the tissue slight dryness due to the processes of respiration, evaporation and germination, leads to a sharp increase in hydrolytic enzyme activity of both carbohydrate and nitrogen metabolism. Slightly dried root are poorly stored due to lower resistance to infection.

After storage the decrease slightly dried carrots, took place due to saturation water cells. To a large extent this was affected by the storage way, so the degree of slightly dried roots on the options, with the use of plastic bags was - 2.1 ... 2.9%, while in root crops with sand layers - 3.1 ... 3.3%. Storing carrots at normal cells hydration causes normal of metabolism.

Changes in the condition cause deflection in the biochemical processes the increased respiration and plastic substances loss in particular. Furthermore, slightly arid roots are less resistant to infection during the storage. Based on these studies can be done you-water, which is the safety of food carrot roots affects both ways of storing and varieties and hybrids. In this regard, the study of varieties and hybrids on the suitability of length-term storage is relevant and appropriate.

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TECHNOLOGICAL EVALUATION OF CARROTS VARIETIES FOR SUITABILITY FOR THE PRODUCTION OF NECTARS

Аннотация: В работе обоснована пригодность корнеплодов моркови для производства морковного нектара, определены физико-химические показатели исходного сырья и готового продукта. Корнеплоды моркови сортов Ярославна и Король Осени могут быть с успехом использованы на овощеперерабатывающих предприятиях для получения нектаров, обладающих высокими вкусовыми и питательными свойствами.

Ключевые слова: овощные нектары, корнеплоды моркови, сорта

According to the "Strategy of development of food processing industry of the Russian Federation for the period up to 2020" (approved by the Decree of the Government of the Russian Federation № 559-r dated April 17, 2012), the increase is necessary for the devel-

opment of fruit and vegetable canning industry for the of competitive-ness of products due to modernization of the existing facilities and construction of new plants and plants for the production of canned fruits and vegetables.

Solution to the problem of the fruit supply and vegetable raw materials increase for processing will be carried out according to the state program for 2013-2020, the project is planned to increase production of canned fruits and vegetables up to 11597 million standard cans. More than 50 investment projects are planned, to be realized include the construction of enterprises for the production of canned fruits and vegetables, bottled juices, dry and frozen vegetables. By the end of 2016 the production of canned fruits and vegetables should be increased up to 10372 million standard cans, canned tomatoes - 1143 million standard cans, canned fruit (including juices) - up to 8136 million standard cans.

Successful implementation of the Strategy objectives depends on the sustainable development of fruit and vegetable canning industry based on the knowledge of intensive approaches and innovative solutions. The main focus in this area is the development of new technologies and equipment, providing a deep, complex, energy- and resource processing of fruit and vegetable raw materials on the basis of modern physico-chemical and electrical methods (including diaphragm, extrusion hydrolytic and biotechnological methods) to create an environmentally safe production of canned fruits and vegetables with different functional properties.

Currently, the most promising for the processing plants is the production of juices, cans, as well as dried and frozen fruit and vegetable preserves.

In many cases, the production of the same type of canned food can be carried out at different technological schemes we are choose the most rational. Ones justification of the choice of technological scheme is to compare several options on indicators such as quality of products, waste and loss of raw materials, continuity, equipment line, simplicity, the level of labor, mechanization space requirements, specific consumption steam, water, electricity, performance line, number of the employees.

Canned fruits and vegetables, especially vegetables, from local raw materials grown without taking into account recommendations for its intended purpose are produced in a large scale.

The range of food carrots, according to the State Register of breeding achievements permitted for use in 2014 on the territory of the Russian Federation, includes 238 varieties and hybrids, most of which have not been investigated for suitability for processing, especially nectars. This circumstance determined the goal of our studies conducted in 2013 at the Department of processing technologies of crop production and in the VSAU laboratory of bio analysis.

The experimental scheme considered the study of 4 varieties of carrots: Rogneda (control), Children's sweetness, Yaroslavna and King Autumn. [1]

Nectar recipe is made in accordance with the instruction manual.

It was found that the highest dry matter content in the roots grade Jaroslavna was 12.98%, up to 3.23% higher compared with the control one.

According to the results of the laboratory research, comparing physico-chemical parameters of the investigated carrot roots two most suitable varieties for industrial processing. Yaroslavna and King Autumn were selected. These grades contain the greatest volume of solids content, carotene and vitamin C.

Preparation of carrot nectar was performed according to the technological instruction. Carrot puree was mixed in a ratio of 1: 1 with sugar syrup of 10% concentration with addition of 0.25% citric acid and 0.025% ascorbic acid. [2]

By diluting puree with syrup, and exposure to high temperatures during sterilization, some parameters of the finished product were considerably lower compared to their content in the raw material.

There was a decrease of dry matter content, calcium and phosphorus, carotene content decreased for all variants of the experiment times. For all the studied varieties in the final product there was an increase in the content of vitamin C, which can be explained by the introduction of ascorbic acid in the process production.

Thus, as a result of the studies we proved that physical, chemical and organoleptic characteristics of the raw materials and the finished product the best varieties of carrots are Jaroslavna and Autumn King.

Therefore we recommend vegetable processing enterprises data the given varieties as raw material for the production of vegetable nectars.

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INFLUENCE OF DIFFERENT WAYS OF CARROT STORAGE ON ITS KEEPING QUALITY

Аннотация: В статье приведены исследования по сравнительной оценке сохранности различных сортов и гибридов продовольственных корнеплодов моркови, изучены наиболее распространенные способы хранения. Установлено, что оптимальным способом хранения продовольственных корнеплодов моркови является хранение в полиэтиленовых мешках емкостью 30-35 кг и толщиной пленки 100 мкм.

Ключевые слова: Хранение, морковь, корнеплоды, сорт.

Carrots have been cultivated for a long time in this country. It is referred as well-known plant to in "Domostroi." Russian written chronicles of the XVI century plant. Grown now carotene red carrot, which we are used to see on our table, did not immediately acquired a red color and became as juicy.

Instructions for yellow carrots use for human consumption are mentioned in ancient chronicles.

By the selection and breeding of various species of wild carrots growing in many parts of the globe, people developed cultural carrots. At present, the carrots are grown all over the world, except the areas with tropical climates.

About 50 thousand hectares are of arable land under the carrots in Russia.

The share of this crop in the total area of vegetable crops depending on the region is 10 ... 20%, which corresponds to 2 - 3 rd places after the cabbage and onions. Carrot has always been a very popular crop as it is a source of biologically active substances necessary for human nutrition.

Carrots as a valuable dietary and medicinal product is particularly important for children's nutrition and balanced feed.

Carrot is especially necessary for human consumption in the spring. However the increase in the production of carrots in the CC is limited by the lack of knowledge cultivation and storage technologies, lack of study of the perspective varieties, as well as stationary stores.

Low productivity of root crops, and frequently their low quality, lead to sharp commodity root vegetables decrease output in the winter-spring period, worse standardization and quality of the product. It is necessary to manage the production of carrots in particular during the entire production cycle.

All the factors that to some extent influence the amount and quality of the crop roots should be take into the account. The study of varieties the carrots, their technological advantages and safety depending on the level of mineral nutrition is the urgent task, as it is important not only to grow but also to maintain the quantity and quality of the product until its consumption or processing.

The successful solution of this problem is closely connected with the study of weather growing conditions, making different combinations of mineral nutrition and identifying the optimal method of storage. When storing food carrots the producer faces two objectives: to preserve the roots till spring and not to reduce their commercial quality.

However, as the production experience, proves food carrot roots, storage even under favorable conditions, is associated with certain losses of nutrients on breathing and other physiological processes, as

well as a high degree of susceptibility of microorganisms. As a result, food carrot roots during storage significantly reduce their commodity quality, and the number of the usable roots.

All ways to store food carrot roots can be divided into two main types: the first is the storage of root crops in the trenches; second is the storage in special storage facilities.

The method that reduces labor costs and makes it possible to adjust the temperature and humidity during the storage, is laying of carrots in storage with forced ventilation. The surface of the heat and mass transfer is almost the entire surface storage facilities. For 1 ton of carrots it is 150 - 170 m², which is two times greater than the natural convection. The intensity of heat and mass transfer venting can be controlled by changing the temperature and humidity parameters and air velocity [3, 4, 5].

One of the most important techniques to reduce the losses and improve the quality of vegetables is a broad introduction of modern packaging to the production process such as containers, boxes, plastic bags, etc. [2].

Noteworthy are food carrot closed storage boxes - containers. In this method, called auto conservation carrots storage quality increases due to the accumulation of carbon dioxide in the boxes, this prevents the growth of harmful organisms. Carrot is put into boxes filled into containers without sand, sealed and stored at normal temperature. Instead of the boxes can be auto conservation layers used soft wood barrels [1].

In the experiments, we tried to carry out the studies on the comparative evaluation of the safety of different carrots food varieties and hybrids and studied the most common ways to store. When designing the schemes and methods of this experiment, we proceeded from the fact that the processes occurring during the carrot storage are a direct continuation of the processes taking place during the growing season. It follows that the degree of internal communication activity the factors that characterizes its state during the growing season is fully reflected during the storage. Therefore, if in a certain way we change the chemistry of the plant before the harvest we can significantly increase or decrease its resistance to pathogens during the storage.

The study included the storage of carrots in bulk using slatted wooden boxes 30-35 kg, plastic bags of 30-35 kg and a film thickness of 100 microns, and the storage of root crops with earth layers as a bulk storage method was used for control. We also studied the effect of different varieties and hybrids on the output quality of carrot roots.

Carrot roots storage results evaluation was carried out in the first half of April.

Analyzing the safety of roots we not only determined the total number of survived root crops but also the number of germinated roots sprouts weight as an indicator of the intensity of this process, the natural loss of roots weight and the level of slightly dried tissue.

The results of the survey of food storage carrot roots showed that the safety of food carrot roots depends not only on the storage method, but also on the differences of the varieties and hybrids.

Thus, the most distinguished storage quality carrots variety was Rogneda. Its root crop yield ranged from 74.6% during storage in bulk to 92.4% in plastic bags. Negative results were obtained when storing food hybrid carrot roots Coral F1. Root storage capacity preservation of this variant yielded 3.5% when stored in bulk and 7.7% when stored in plastic bags.

Different ways of storage have a significant impact on the safety. The highest yield of standard root crops was observed during roots storage in plastic bags in all variations of mineral nutrition: 72.9% - 92.4% and Shantane - Rogneda.

The safety of roots during storage in wooden boxes significantly increases (75.2 - 81.9%).

Thus, we can assume that the best way to store food carrot roots is plastic bags of 30-35 kg and a film thickness of 100 microns. It can be recommended and storage root crops in wooden boxes of 30-35 kg.

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PECULIARITIES OF GRAPE SNAIL SHELL CHEMICAL COMPOSITION IN THE ASPECT OF COMPLEX MOLLUSK PROCESSING

Аннотация: В этой статье приводятся данные химических исследований раковины виноградной улитки на наличие биогенных элементов. Результаты анализов подтверждают гипотезу, что раковина может послужить полноценным сырьем для получения препаратов с функциональным значением. Также в приводиться обоснование высокого уровня перспективы разработки технологии комплексной переработки виноградной улитки.

Ключевые слова: виноградная улитка, раковина улитки, химический состав, биогенные элементы, комплексная переработка, препараты с функциональным значением.

Modern society has reached a level of development when the decision on the rational use of natural resources is no longer a problem with long-term perspective, and is a necessary step.

Development of non-waste, cyclical processing technology resources is the most appropriate in modern science.

Today, snail is known in cosmetology, medicine, cooking [1]. The value of a grape snail is many-sided and for development of its complex processing it is necessary to conduct a set of researches. Testing Laboratory Centre ANO "SEC" Fodder" tests were carried out shell snail on the presence of macro- and micronutrients. The tests were conducted according to the following regulations:

- determination of the mass fraction of calcium, according to the State Standard 26570
- determination of the mass fraction of phosphorus, % according to the State Standard 26570
- determination of the mass fraction of sodium, according to the State Standard 13496.1
- determination of the mass fraction of magnesium, % IPA F 14.1: 2: 4.167-2000
- determination of the mass fraction of iron, mg / kg according to the State Standard 26928
- determination of the mass fraction of copper, mg / kg according to the State Standard 26928
- determination of the mass fraction of zinc mg / kg according to the State Standard 30692
- determination of the mass fraction of manganese mg / kg according to the State Standard 30692
- determination of the mass fraction of cobalt mg / kg according to the State Standard 30692.

The following a results were obtained: calcium content was prevalent (39, 04%), iron (2.19 mg / kg), zinc (34, 4 mg / kg) and manganese (24, 50 mg / kg). Other elements were in the minority and therefore are of no practical interest.

As it is known, calcium, iron, zinc and manganese are essential elements for the human body. Their role for a human body was studied long ago and is as follows.[2]

1. The role of calcium in the body: the coordination of cell membrane permeability, intracellular processes, in nerve conduction, muscle contractions, maintaining the cardiovascular system, bone formation and mineralization of the teeth part in an important stage of hemostasis - blood coagulation.

The total daily calcium intake is - 800 - 1250 mg, the maximum consumption amount is - 2500 mg.

The best sources for assimilation are: seafood, liver, fish, beans, raw egg yolk, celery, cabbage, parsley, spinach, apricots, grapes, currants, pineapples, oranges, cottage cheese.

2. The role of zinc in the human body cannot be over-emphasized; it is worth mentioning that the trace element is involved in the vital processes such as development of bone tissue, stimulation of the division and growth of cells. Zinc is involved in tissue regeneration, in the development of brain cells. It plays an important part in the human reproductive function. It is also considered that the major role of zinc in the human body is that it is an antioxidant. The total daily consumption rate is 8 to 10 mg per day.

The best sources for assimilation are: pumpkin seeds, sesame seeds, peanuts, cooked chicken heart, boiled beef tongue, boiled beef.

3. Manganese has the following functions in a human body: participates in the production and metabolism of neurotransmitters in the CNS contributes to its formation. Enhances the action of insulin; fights free radicals; supports the stability of the of cell membranes structure; contributes to the normal functioning of muscle tissue; participates in the synthesis of thyroid hormone - thyroxin. Manganese is especially important during the growth of an organism allowing the formation of a normal bone structure, the development of connective tissue, cartilage, takes part in the regulation of blood sugar levels by increasing glucose uptake of a cell. It is involved in the synthesis of fatty acids, reduces the level of lipids in the body, strengthens the process of fats disposal. Vitamins B, E, C exchange, choline, copper participates in the enzymatic activity, promoting the normalization of the energy balance, improve the immune functioning system: manganese is required for the synthesis of interferon.

Food products manganese in food are: wheat and rice bran, rye bread, buckwheat, rice, oats, sprouted grains, soybeans, peas, potatoes,

beets, tomatoes, carrots, spinach, parsley, blueberry, black currant, pineapple, plum, herbs such as bloodroot, eucalyptus, rosemary, bean trefoil; peanuts, hazel-nuts, tea, coffee.

Manganese norm in the diet is 1-2 mg, the maximum volume of consumption is 11 mg. 5-10 mg should be ingested with food considering digestibility.

4. The role of iron in the human body is the following: storage and transportation of oxygen; metabolism; the process of hematopoiesis; production of DNA; immune response to bacterial or viral infection; redox reactions; energy metabolism.

Beef liver and kidneys, fish and eggs contain the greatest amount of iron.

The average daily rate of iron is 10 mg for men, 15-20 mg for women, the maximum amount per day is 45 mg.

As a result it was proved that the grape snail shell can be regarded as a complete raw material for the preparation of functional value together along with conventional sources.

Integrating the knowledge of the protein amount in meat (to 72, 2% in terms of absolutely solid) [3], amino-acid composition of protein (protein has a full set the proteinogenous of amino acids, including irreplaceable in the sum and semi-replaceable) [4], result of impact of sublimation drying on a snail of *Helix Pomatia* [4] and data on micro and macroelementary shell structure, it is possible to judge grape snail complex technology development prospect.

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NEW FOOD PROTEIN NANOCOMPOSITES FOR EMULSIFIED MEAT PRODUCTS

Аннотация. Рассматриваются перспективы использования растительных ресурсов на примере бобов люпина в мясной промышленности как источника для получения комбинированных пищевых систем. Обосновано использование и описаны основные свойства фермента транsgлютаминазы с целью использования в технологии эмульгированных мясных продуктов. На основе совместного использования мясного сырья и растительных добавок разработана рецептура мясного хлеба комбинированного состава повышенной пищевой и биологической ценностью.

Ключевые слова: фермент транsgлютаминаза, растительный белок, мясной продукт, биологическая ценность

The requirement of the consumer market is the manufacture of meat products of available price segment with traditional organoleptic characteristics: not only the color, taste, aroma, but texture, all well. A

compromise solution in this area is the use of structure-forming plant additives in meat technology [1].

For intensification of structure formation in the combined meat-vegetable systems is prospectively the use of biocatalysis. The enzyme transglutaminase (TG) catalyzes the reaction of acyl migration, introducing covalent ϵ -(γ -glutamyl) lysine links between proteins and producing polymers of high molecular weight [5]. Modification of proteins by TG allows you to change their solubility, hydrating, thermostability, and their gelling, rheological properties, emulsification and rennet coagulation in the case of dairy products [2, 4].

Thus, the urgent task is to develop new food protein nanocomposite for use in technology of emulsified products. Elements of the new concept for the creation of combined meat products on the basis of emulsions are alternative herbal ingredients and processing methods of enzymatic processing of combined food systems with transglutaminases.

As objects of research we used poultry of mechanical deboning, mid-back, semifat trimmed pork, pine flour obtained by grinding the seeds of the lupine varieties of Desnianskyi selection GNU Institute of lupine (Bryansk), an enzyme (TG) transglutaminase "REVADA TG 11" (BDF Natural Ingredients, S.L., Spain).

Minced meat loaf "Zakaznoi" was used as control. We studied functional and technological properties of the model minced meat with 50 % replacing of the basic raw material by mechanically deboned chicken meat with the addition of lupine flour in the amount of 0-10 % and commercial enzyme preparation REVADA TG 11 in the amount of 0.1 to 1.1 % to the weight of meat.

For displaying the enzymatic effect the stuffing was maintained at a temperature of +2°C for 24 h [3]. It is established that the control samples had loose, pasty consistency, and experienced - tight and elastic. The maximum values of moisture-binding and water-holding capacity are for 85.5 and 78.5%, respectively. They are achieved with the introduction of hydrated flour in the stuffing in the amount of 5.0 % and enzyme preparation in the amount of 0.3 %. Thus the mass

yield of product is increased from 110 to 120 %, the products are characterized by high juiciness.

On the results of these surveys was developed the formulation and technological scheme of the production of meat loaf, and was carried out the experimental-industrial production of meat loaf "Liskinsky" on the basis of the Individual Enterprise "Protein-Voronezh" using 5 % lupine flour and 0.3 % enzyme preparation TG to the weight of the main raw material. Control sample was developed with the addition of 1 % egg protein as the gelatinizer.

The results of the complex physico-chemical, technological and organoleptic studies have shown that experimental samples of meat loaves made with vegetable protein and enzyme preparation transglutaminase "Revada TG 11", were the same on main indices as the control products, and according to a number of indices had the advantage. A positive test result was the increase of the yield of meat loaves up to 120 % due to the increase in the mass fraction of protein due to the introduction of lupine flour and enzyme transglutaminase.

Thus, the new food protein nanocomposites with the use of protein-glutamine γ -glutamyltransferase enable the efficient use of low-grade meat and alternative vegetable raw materials in technology of emulsified products with high nutritional and biological value.

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DER MARKT DES GEFLÜGELFLEISCHES: DIE TENDENZEN UND DIE PERSPEKTIVEN DER ENTWICKLUNG.

Аннотация: Проанализирован рынок мяса птицы. Изучен объем производства мяса птицы различными компаниями. Даны тенденции и перспективы развития данного рынка.

Ключевые слова: Рынок, мясо птицы, качество мяса, конкуренция, прогноз потребления мяса.

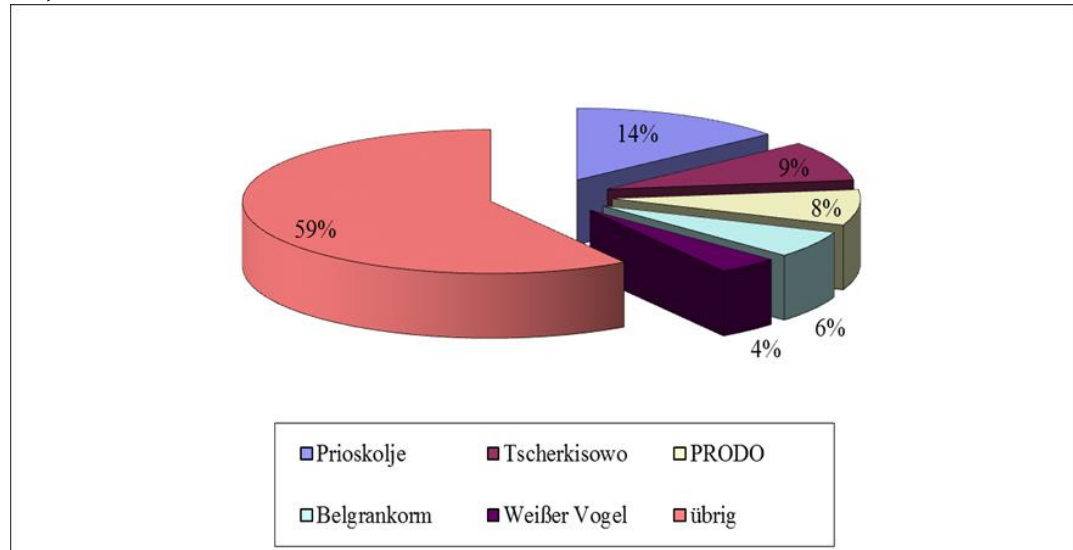
Der Markt des Geglügefleisches in Russland ist eines der konsolidiertsten Segmente der einheimischen Fleischindustrie, ungeachtet ziemlich großen Menge der kleinen Produzenten. Mehr als Hälfte des allgemeinen natürlichen Produktionsumfangs des Geglügefleisches fällt auf 12 größten Unternehmen Russlands.

Unter den führenden Gesellschaften der Geglügelproduktion unterscheidet man folgende: Die Gruppe "Tscherkisowo", die geschlossene AG «Der Weiße Vogel», die Gruppe «PRODO», Altai-"Tschiken-Dak", «Die Tschernjanskaya Entenfarm», die geschlossene AG «Die sibirische landwirtschaftliche Gruppe», die Agroholdinggesellschaft «Das russische Feld», die GmbH «Ptizekompleks Nesterowskij», die Publikumsgesellschaft «Die Geflügelgroßfarm "Ref-tinskaya", die Publikumsgesellschaft «Die Nerjungrinskaya Geflügelgroßfarm», den Agrokonzern «Die goldene Ähre» und eine Reihe anderer Gesellschaften (Die Abb. 1).

Die Produzenten des Geglügefleisches verstehen die Forderungen nach der Konkurrenz, die die Integration mit dem internationalen Markt auflegt. Außer der technischen Umrüstung für die Versorgung der Konkurrenzfähigkeit der Produktion des Zweiges auf einheimischen Markt und den Geglügefleisches, ist es nötig, die Vervollkommnung der normativen Basis zu beenden und die Übereinstim-

mung die einheimische Produktion den internationalen Forderungen zu gewährleisten.

Die Abbildung 1- Der Produktionsumfang des Geflügelfleisches von verschiedenen Marktteilnehmern, %



Man muss den qualitativen russischen Rohstoff für die Produzenten zugänglich machen. Zu diesem Ziel ist es nötig, den notwendigen Bestand der reinrassigen Hühner zu züchten, wozu man mittels der Entwicklung der Basis der selektions-genetischen Zentren kommen kann. Neben den Broilern ist es wichtig, die Produktion der Trut-hennen, der Enten, der Gänse und der Wachteln zu entwickeln. Dank diesem kann man das Spektrum der Produktion des Geflügelfleisches auf dem Konsummarkt ausdehnen.

Die Geflügelzucht ist einer der erfolgreichsten Zweige des Agrar-Industrie-Komplexes Russlands. Aber vom Wirtschaftsstandpunkt werden in der Geflügelzucht des Landes bestimmte Schwierigkeiten beobachtet. In solchen Gebieten wie Swerdlowsk, Pensa, Samara und Kirow werden auf den Verkauf einige Geflügelgroßfarmen ausgestellt. In einigen Gebieten ist ihre Tätigkeit vollständig angehalten.

Der Prozess der Einleitung der Regulierungsinstrumente des Marktes des Geflügelfleisches ist schwierig und langwierig. Zurzeit werden die Marktmechanismen der Bewirtschaftung in der Geflügelzucht nicht wirksam genug verwendet. Jedoch ist es ein Hauptfaktor der Erhöhung der Konkurrenzfähigkeit der Gesellschaften, die die Geflügel erzeugen. Es handelt sich vor allem um die Bildung der

wirksamen Logistiksysteme des Produktionsmarktes der Geflügel-Industrie unter Berücksichtigung aller Prinzipien der Marktwirtschaft.

Die russische Unternehmen für die Geflügelverarbeitung teilen gewöhnlich ihre Verantwortungssphären nach die Logistikketten, aber das ermöglicht nicht die Logistik als eine allgemeine Aufgabe zu überwachen und erschwert die Komplexität bei der Mechanisierung dieses aufwandreichen Prozesses.

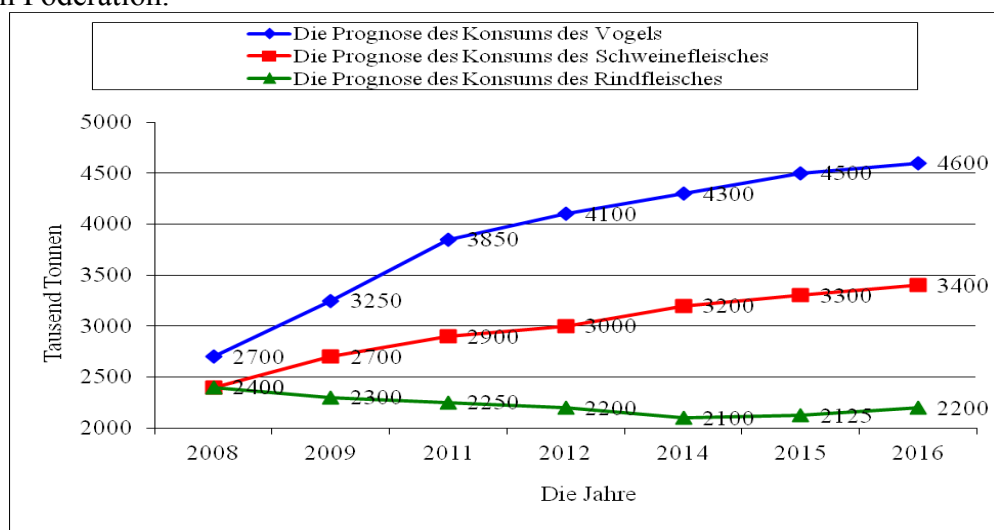
Die Komplexbehandlung erlaubt viele derzeitige Schwierigkeiten in den russischen Unternehmen mit der Berücksichtigung ihrer sich entwickelnden Leistungsfähigkeiten zu vermeiden. Nach der Meinung einigen Experten wird die Konkurrenz in der kurzen Frist nicht zwischen den Einzelbetrieben für die Geflügelproduktion, sondern zwischen den Logistikketten, die das eingeplante Niveau der Konsumbelieferung im Vergleich zu relative niedrigen Gesamtkosten gewährleisten, entstehen.

Die Entwicklung der Geflügelproduktion in Russland können folgende entscheidende Faktoren beeinflussen:

- Bereitstellung der Vorzugskredits auf der staatlichen Ebene in Russland für die Realisierung der Investitionsprojekte und Vorzugseinkauf der Anlagen für die Fleischindustrie;
- Tarif- und Zollregelung und Beschränkung der Einfuhrquoten;
- Innovative Lösungen im Bereich der Selektion, Genetik, Tiermedizin, Verarbeitung, Einführung der neuen Technologien dank der wissenschaftlichen Forschungen;
- Auftritt der Großinvestoren in diesem Bereich.

Man erwartet, dass der Konsum des Geflügelfleisches unter der Bevölkerung zunimmt: zum 2020 kann der Konsum des Geflügelfleisches 45% vom Gesamtkonsum des Fleisches einnehmen. Die Weltwirtschaftskrise hat den russischen Geflügelmarkt beeinflusst. Einerseits widerspiegelt sich das in der Massenumstellung der Aufmerksamkeit von Konsumenten zu den Geflügelfleisch, andererseits beginnen die ärmere Bevölkerungsschichten, die den bedeutenden Anteil der Konsumenten bilden, Fleisch als Produktion "über ihre Mittel" zu betrachten (Die Abb. 2).

Die Abbildung 2 – Die Prognose des Konsums von den Fleischhauptarten in der Russischen Föderation.



Man erwartet, dass man in den nächsten Jahren die stabile Steigerung des Geflügelfleischkonsums, die zugängliche Quelle des tierischen Eiweißstoff, Steigerung des Schweinefleischkonsums und kleine Steigerung des Rindfleischkonsums mit der Berücksichtigung seines hohen Preises, betrachten kann. Zum 2017 beträgt der Konsum des Rindfleisches 2,3 Mio. Tonnen, des Schweinefleisches – 3,5 Mio. Tonnen, Geflügelfleisches – 4,6 Mio. Tonnen.

УДК 637.049

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FEATURES OF THE CHEMICAL COMPOSITION OF THE LUPINE AS RAW MATERIALS FOR PRODUCTION PROTEINACEOUS CONCENTRATES

Аннотация. В статье рассматривается химический состав бобовых культур, обоснован выбор люпина белого как сырьевого источника растительного белка отечественного производства.

Ключевые слова. Химический состав, зернобобовые культуры, ультраструктурная организация, белковый концентрат

At present among vegetable sources of protein the preference is given to beans. It is connected with the fact the proteins content in bean seeds is 2-3 times higher, than in cereal. They are biologically more full-fledged (Tab. 1). Besides animal protein is acquired more slowly, contains cholesterol, the remains of drugs and fodder substances fed to animals [1].

Table 1 Average chemical composition of bean seeds (g/100 g of a product)

Culture	Water	Proteins	Lipids	mono- and bioses	Farina	Cellulose	Ash
Bean	12,16	27,39	1,31	5,71	43,4	3,9	2,73
Peas	14,00	20,10	4,30	3,20	43,2	3,7	3,00
Lupine	13,70	36,20	3,50	4,35	41,9	3,6	3,12

The leguminous take an exclusive place among vegetable food staples of thanks to the unique biochemical structure caused mainly by high protein content. Now the greatest attention of the researchers is paid to soy which products of processing find broad application in the food industry. However not less attention should be paid to such crop which is traditionally grown up in the territory of Russia as a lupine [5].

The lupine white has a high nutrition value due to 38% of protein, vitamins of group B, PP, mineral substances and cellulose in its structure, is characterized high productivity and low cost [2].

It should be noted however that bean seeds contain toxic components such as saponita, alkaloids and substances inhibiting proteolytic enzymes and hormones of a digestive tract to which inhibitors of trypsin and a fitogemaglyutnenina belong. These substances are removed with water when soaking or are deactivated at heat treatment [4].

The content of vitamins and mineral substances in bean grain are specified in table 2. It proved the priority role of lupine white as a perspective source of full-fledged food protein of a home production.

Table 2 Content of nutrients, vitamins and mineral substances

Name	Peas	Bean	Lupine
Content of vitamins, mg/kg			
1	2	3	4
A	3,8	1,8	2,5
B ₁	9,9	4,8	6,38
B ₂	5,2	1,8	1,17

Table 2 continuation

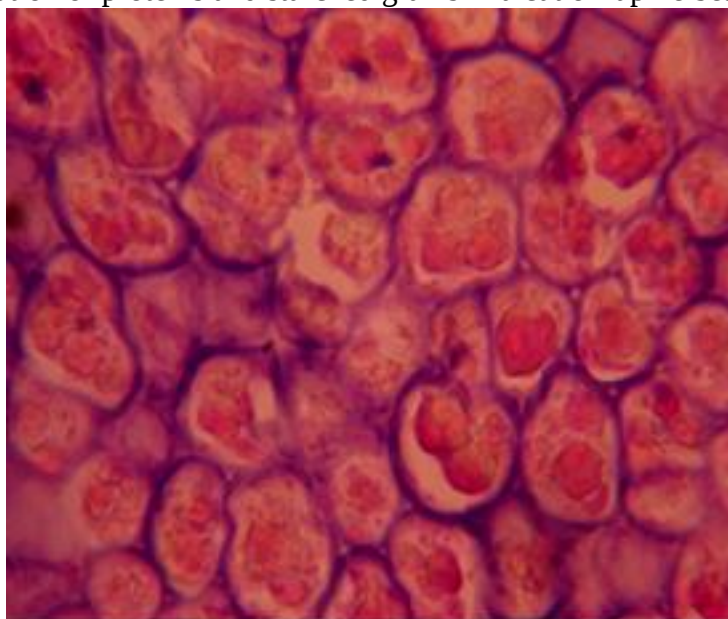
1	2	3	4
B ₆	11,9	-	3,37
Niacinum	25,1	16	26,2
E	-	-	6,5
Content of mineral substances, mg/kg			
K	174	112	184
Ca	260	110	170
P	290	130	275
Mg	250	89	180
Fe	85	67	64

It is very important that lupine is rich in potassium, magnesium, phosphorus, in small amounts in calcium and iron.

Importance of structural researches of biopolymers, including proteins is urgent. Identification of spatial structure of the increasing number of biopolymers does not only deepens molecular bases of a live matter functioning understanding, but also is one of the defining factors of scientific and technical progress. Knowledge of the molecules structure often allows producing biologically active, including proteinaceous preparations in a new way.

Within the conducted researches the microstructural organization of seeds of lupine from a distribution position in seeds of proteinaceous fragments and starched grains was studied. The ultrastructural organization of seeds of lupine is presented in Fig. 1.

Fig.1. Localization of proteins and starched grains in a cut of lupine beans



Three main components are found in a cell structure: the inter-cellular wall, vacuoles holding the central position and the protoplast which is forced out by vacuoles to the periphery in the form of a wall layer in mature cell. These components are accurately viewed in the photos received on an electronic microscope by means of transmission microscopy [3].

Along a cellular wall the carbohydrate fraction – starched grains, local light inclusions, is a fatty component is presented in the form of multiple inclusions.

Proteins are a part of the majority of cellular and fabric structures. Plastic, power, transport and fermental processes are connected with them. Histochemical identification of proteins is of great importance for the characteristic of the processes which happen in cells and tissues. For this purpose histochemical identification of the proteins which are localized in structural elements of a lupine seed were.

During the histomorphological analysis of lupine it is proved that the congestion of proteins is generally localized in cotyledons (0,85 units of optical), while in their cover it is much less (0,25 units of optical).

Thus cotyledon is of greatest practical value for proteinaceous preparations though proteins are also contained in a seed cover. It should be noted that separation of a seed cover from a cotyledon while producing high pure proteinaceous preparations is inexpedient as it leads to additional losses of protein and additional expenses.

Thus the analysis of a chemical composition shows that it is very perspective to use seeds of lupine white as the raw source cultivated in the conditions of Central Chernozem region and having rather extensive resources that is important at their use as dressers at creation of the combined products for protein concentrate production.

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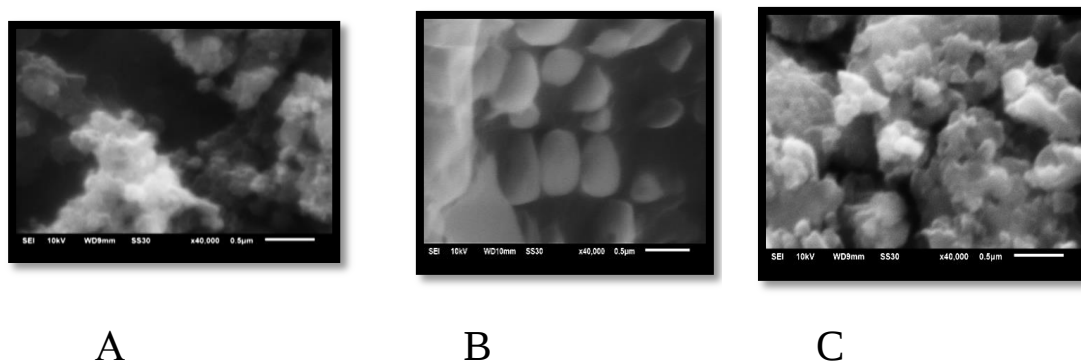
SORPTION OF HEAVY METALS IN NEW COMPOSITE MATERIALS

Ions of heavy metals (HM) are among the most dangerous toxins. Industrial waste water is mainly the source of heavy metals penetration into water. Migrating through the trophic chains, they enter the body, blocking the enzyme systems and disrupting metabolism. Therefore the most important environmental problem is water conditioning for use in food industry and for drinking purposes. Among the methods of water purification from HM (deposition of alkaline reagents, chemical, electrochemical coagulation, etc.) quite effective are sorp-

tion methods. However, they have several drawbacks: they are not very selective to heavy metals, such as in ion exchange sorbent occurs "poisoning". Therefore an important task is to obtain new sorbents providing high efficiency of water purification from HM.

For complex water purification from HM, we developed a number of composite sorbents. Their components are basis of the silica (silica and kaolin synthetic), activated charcoal and silver ions. Depending on the conditions of synthesis of sorbents had various degrees of dispersion with a predominance of nanoparticles (Figure 1).

Fig. 1 Electronic photos sorbents BACA -001 (A), BACA-002 (B), BACA-003 (C). 40 000 times increase.



Natural and drinking water of Voronezh is characterized by a high content of iron and manganese compounds. It was of interest to establish the selectivity of the sorbents to ions of these metals. Conditions were created in research preventing the formation of hydrolysis products in the solutions, which was achieved at pH equal or below pH of hydroxide precipitation. Sorption of Fe^{3+} ions in the composites by the limited volume method at pH 1.87 showed that the process is carried out by ion-exchange mechanism with high selectivity. The sorption results were calculated from the linear form Langmuir isotherms they are shown in Table 1.

Table 1. Maximum specific sorption (G_{∞}) exchange capacity (E) and selectivity coefficient (K) relative to the composites of Fe^{3+} ions

Sorbent	G_{∞} , mmol / g	E · mg eq / g	K, g / mmol
BACA -001	0,96	2,88	57
BACA -002	1,27	3,81	143
BACA -003	2,15	6,45	332

The highest selectivity and exchange capacity observed in the sorbent BACA-003 having the highest degree of dispersion (Figure 1) [1].

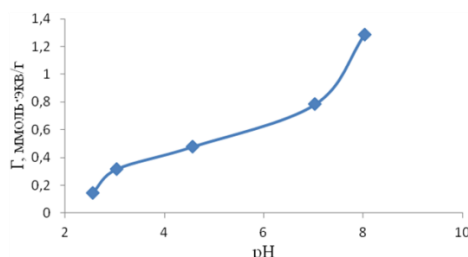
A particular problem is the definition of an equilibrium solution of ions Mn^{2+} , as the dissolved oxygen oxidizes them to Mn (IV) and to the anionic form, which for the sorbents for cation exchange properties are co-ions. Therefore, initially the process of adsorption of Mn^{2+} ions was carried out from a solution containing active reducing agent hydroxylamine hydrochloride. However it was found that in contrast to Fe^{3+} ions in the strongly acidic medium Mn^{2+} is not almost sorption even on most particulate sorbents BACA -003. Therefore, the need is to determine the effect of pH on the sorption properties of the solutions of the composite relative ion Mn^{2+} .

Sorption was conducted by the method of a limited volume with circulation. 200 ml of MnSO_4 Solution was circulated through the column containing 5 g of sorbent every 30 min. The samples from the solution were taken for the analysis at the Mn^{2+} ions by trilonometric titration [2], and portions of sodium hydroxide were added to the solution. After each NaOH portion addition into the solution pH was shifted towards the alkaline region. Operations were repeated until the pH reached 7-8, which was below the precipitation onset pH $\text{Mn}(\text{OH})_2$ [3]. It corresponded to the actual acidity and drinking water. According to the analysis of the solution specific sorption (T) Mn^{2+} ions was calculated according to the formula:

$$\Gamma = \sum_{i=1}^i \frac{(C_i - C_{i+1})V}{m}$$

where C_0 and C are the concentration of Mn^{2+} in the neighboring samples, V - volume of the solution, m - mass of the sorbent.

The results of calculation for the sorption from the solution with concentration of 0.1552 mol eq / L are shown in Figure 2.



A significant increase of specific adsorption with pH increase is related to the transition of sorbent silicate basics of acid in salt form, which increases the exchange capacity and makes interaction of counter- Mn^{2+} with fixed groups of sorbents more intense.

Since water content of manganese compounds natural and waste may vary widely it is of interest to identify the effect of the ion concentration on the degree of its sorbent extraction.

As a result of the experiment the degree of extraction of the ion R, as the ratio $(C_0 - C) / C$ was calculated. C and C_0 are the initial and final concentrations. Data are shown in Table 2.

Table 2. Dependence of the specific sorption (T) Mn^{2+} ions on the sorbent BACA - 003 on the pH

$C_0 \cdot \text{mol eq / L ,}$	0,0018	0,0078	0,0161	0,0762	0,1552
R, %	100	65	63	31	20

Thus the composite BACA-003 is quite active sorbent compared to Mn^{2+} ions in the environment close to neutral. High degree of extraction of the ion from the solution at low concentration allows evaluating the use of a composite perspective BACA-003 in the systems of natural and waste waters purification.

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***Секция VI. Землеустройство, кадастр и управление
водными ресурсами в современных условиях
Section VI. Land survey and water resources management
today.***

УДК 528.88: 332.3

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**UNE BREVE ANALYSE DE LOGICIEL DE
SURVEILLANCE DES AUTOROUTES**

Аннотация: В статье приведен краткий анализ программного обеспечения мониторинга автомобильных дорог, а также их достоинства и особенности по информационным критериям.

Ключевые слова: программное обеспечение, автомобильные дороги, информационные критерии.

Les routes sont l'un des plus importants systèmes de transport du pays, qui a un impact énorme sur son développement social et économique.

Le système dynamique des routes et, par conséquent, la planification, l'entretien et la réparation exige beaucoup d'attention. Cela n'est possible que lors de l'utilisation du système de surveillance.

L'objectif principal du système d'information pour la surveillance des routes est de créer un espace d'information unifié dans la dynamique du changement et de la relation de ses composants.

Les principes de base de système d'information géographique (SIG) des routes sont:

- SIG des routes est basé sur les documents normatifs, et est compatible avec d'autres composants d'un seul champ d'information du cadastre urbain;
- le système créé est ouvert et admet des modifications et des compléments;

- le système d'interface est facile à utiliser et à comprendre intuitivement pour l'utilisateur;
- le système d'information géographique des autoroutes permet d'utiliser ses résultats et les recevoir à tout moment.

L'information fiable, pertinente et complète sur les objets et les processus sur le territoire des municipalités est une garantie de l'efficacité des décisions de gestion. La source de ces informations est issue des données de télédétection (de la Terre) et de la résolution ultra-haute.

Dans le secteur forestier, la technologie SIG et de télédétection (de la Terre) est activement utilisée pour l'inventaire des forêts, pour la détermination des caractéristiques qualitatives et quantitatives des zones forestières, pour l'évaluation des dommages causés par des incendies des forêts, des maladies des forêts, la pollution de l'air, des exploitations forestières illégales.

La technologie SIG et des données de télédétection sont largement utilisées dans la résolution de divers problèmes de gestion des entreprises territoriales et de l'infrastructure du pétrole et du gaz.

L'utilisation de l'imagerie satellitaire pour la surveillance et l'évaluation des territoires protégés est une méthode efficace et objective, elle permet d'obtenir des résultats rapides.

La surveillance des zones des catastrophes naturelles et l'organisation des travaux de reconstruction sont les tâches les plus importantes dans le monde actuel. La technologie SIG et les données de télédétection sont optimales pour résoudre les problèmes dans les domaines de la gestion des situations d'urgence.

L'imagerie satellitaire fournit une base solide pour l'inventaire des infrastructures de transport: des routes, des chemins de fer, des pipelines, des voies navigables, des aéroports et des ports, ainsi que pour la planification des travaux de réparation.

Le système municipal d'information géographique est basé sur la technologie SIG et les données de télédétection, il fournit l'information à l'administration locale pour la gestion des activités de construction et d'autres tâches.

L'un des domaines les plus prometteurs pour l'utilisation des données de télédétection et de la technologie SIG est l'agriculture. Le lever d'un plan peut améliorer considérablement les méthodes de contrôle des cultures et des prévisions de récolte à la fois aux niveaux régional et local, et résoudre d'autres problèmes de l'agriculture.

Actuellement l'utilisation des données de télédétection joue le rôle très important pour la prospection et l'exploration des gisements de minéraux.

Les données de télédétection et les technologies SIG sont largement utilisées dans l'étude de la structure du paysage, des ressources naturelles et des types de la faune, ainsi que de l'analyse du degré de contamination de l'atmosphère, des ressources naturelles (en terres et en eau), aux travaux de l'évaluation de l'impact de l'homme sur l'environnement.

Les données de télédétection sont largement utilisées comme un support d'information pour le développement et l'exploitation des bâtiments et des stades sportifs, des zones de loisirs.

Ci-dessous, on considère un logiciel qui peut être utilisé pour la surveillance routière [1, 2].

INPHO

INPHO est un système plein de fonctionnalités de photogrammétrie pour les solutions des tâches standards de photographies numérique, y compris la phototriangulation, la photo en relief, l'ortho-transformation, la stéréo-photographie, etc. On peut considérer le logiciel INPHO – Allemagne comme une des meilleures variétés des applications de photogrammétrie.

Le logiciel INPHO est conçu pour le traitement des projets les plus complexes de photogrammétrie au bloc de 20000 images et plus. Pour le traitement de grandes quantités de données on met en pratique le logiciel spécial (DPMaster), qui est un outil pratique pour la réalisation de traitement parallèle. Cette fonction est accessible pour effectuer l'orthorectification des photos (OrthoMaster) et l'extraction automatique des modèles numériques du relief (MATCH-T DSM).

En outre, la société offre des programmes innovants, des solutions pour le traitement des modèles numériques de terrain, y compris le filtrage et l'édition du laser (LIDAR), ainsi que les données des satellites d'observation.

Chaque module est une solution indépendante de programme INPHO, qui peut être facilement intégré du processus dans un flux de travail existant. Le noyau d'INPHO est l'Application Master.

Les principaux modules du logiciel INPHO sont **Géolocalisation (géoréférencement)**

MATCH-CAT est le module qui permet d'exercer la phototriangulation automatique, il est basé sur les algorithmes avancés et uniques du traitement des images.

InBLOCK est le module conçu spécifiquement pour l'ajustement du bloc photogrammétrique et l'étalonnage des appareils et des systèmes.

MATCH-T DSM est le module qui permet de créer des modèles numériques dans un régime entièrement automatique, selon des images aériennes ou par satellite.

DTMaster est le module de contrôle de la qualité et de l'édition des modèles altimétriques numériques.

On peut utiliser certainement les modules supplémentaires ENVI : Atmospheric Correction Module (ACM), DEM Extraction Module (DEM), ENVI Feature Extraction (ENVI FX), Orthorectification, NITF, SARscape, SARscape Basic, SARscape Focusing, SARscape Gamma-Gaussian Filter, SARscape Interferometry.

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DAS MONITORING DER FLUSSNIEDERUNGSBÖDEN IM SYSTEM DES REGIONALEN AGRARINDUSTRIEKOMPLEXES

Аннотация: рассматривается перечень контролируемых геофизических параметров на действующих полигонах Липецкой области с решением проблемы мониторинга пойменных земель в системе рационального землепользования (землевладения).

Мониторинг пойменных земель рекомендуется проводить на малых водосборах и в речной бассейновой сети. Предложена структура агроэкологического мониторинга.

Ключевые слова: мониторинг, пойменные земли, фации, деградация почв, переувлажнение, признаки гидроморфизма.

***Die Natur ist die beste und objektive
Lehrerin bei der Lösung schwierigster Aufgaben der
Wissenschaft.***

W. W. Dokutschajew

Die Vergrößerung der Anthropogenbelastung auf die Umwelt, die von der Intensivierung der landwirtschaftlichen Produktion begleitet wird und auch als Folge zur Verschlechterung der Bodenqualität gebracht hat, braucht das Monitoring der Flussniederungsböden.

Bei der Organisation des Monitorings der Flussniederungsböden der kleinen Quellgebiete bildet sich die informative Sicherstellung von den ökohydrologischen Forschungen aus: 1) der Materialien der Beobachtungen der meteorologischen und hydrologischen Netzstationen und des Hydrometeozentrums Russlands; 2) der spezialisierten Stationen und der Stellen von Forschungen, sowie der zeitweiligen Punkte der Beobachtungen, die bei den Expeditionsforschungen gelten; 3) der kosmischen Beobachtungen; 4) der Ergebnisse der theoretischen, sta-

tistischen und empirischen Forschungen; 5) der geographischen Informationen.

Eine wichtige Aufgabe hier ist die Koordinierung der zu kontrollierenden geophysikalischen Angaben auf den Bodenhallen des Gebiets Lipezk mit der praktischen Lösung des Problems des Monitorings der Böden.

Das System des Monitorings der Flussniederungsböden der kleinen Quellgebiete wird unter Berücksichtigung der Bestimmung der Struktur der Landländereien als eines wichtigen Teils der beinahe liegenden Umwelt entwickelt. Das vorliegende Monitoring wird im Rahmen des natürlichen kleinen Quellgebietes, dessen Bestandteile die Komponenten der Landschaft (das Klima, des Wassers, des Bodens, sowie die Anthropogenese) durchgeführt. Das Monitoring der obengenannten Böden bildet ein Einheitssystem je nach den Aufgaben der Forschung. Die Aufgabe der Forschung wird für jedes konkrete Quellgebiet lokalisiert. Deshalb wird sie am wirksamsten durch das Monitoring der Flussniederungsböden der kleinen Quell- und Stromgebiete verwirklicht.

Die Konzeption des Monitorings der Flussniederungsböden der kleinen Quellgebiete erfordert die geophysikalischen Parameter angesichts der klimatischen und hydrologischen Eigenschaften zu bestimmen, die oft auf das Hochwasser der Flüsse einen Einfluss ausüben, sowie infolge der Veränderungen der Struktur der landwirtschaftlichen Nutzflächen vorhanden sind. Man muss auch den geomorphologischen Bau des Reliefs, der Landschaftsbesonderheiten des Territoriums berücksichtigen. Die Ablagerungen des Flussbettes nehmen die Zwischenlage zwischen den Flussbett- und Flussniederungsböden von Alluvial Böden ein, ein Produkt des Hinaustragens und der Ablagerung an den Rändern der Vermessungsflußbetten der gezogenen Teilchen der Abtragungen im Laufe des Abflusses. Die Abtragungen sind von den Sanden vorgestellt und sind in den Schwimmbädern der Flüsse am meisten charakteristisch, in denen Bau sie ebenso vorwiegen. In den Schwimmbädern der Flüsse, die vorwiegend einen lehmhaltigen Boden vorstellen, offenbaren sich die Strombettablagerungen schwach oder zusammen mit den Sandablagerungen überhaupt fehlen.

Die Fluss- und innere Küstenzone ist im Unterschied zur Zone der Flussbettabtragungen, die als Grenze zwischen dem Flußbett und

der Aue liegt, sind eng miteinander verbunden. Für die Flusszone der Sedimentation, die nahe zum Flußbett liegt, ist die Bandfazies kennzeichnend. Sie besteht aus den kleinen und feinkörnigen Sandschichten als auch aus den Aleuriten, und weniger mächtigen Lehmsandzwischen-schichten, oder aus der Fazies der mächtigeren Ansammlungen der Sandschichten und Schlümpfen. Diese Fazies haben keine weltweite Verbreitung und gravitieren zu den abgesonderten für ihre Bildung günstigsten Punkten. Oft fehlen sie sogar, und von der Küste fängt das Gebiet der Ansammlung mehr feinkörnigerer Anschwemmungen an, die pflanzenbedeckt sind. Auf den Flussniederungsböden, die eine mächtige Lehmbedendecke haben, trifft man auch Fazies der Linsen-Schichtlehmböden. Die letzten Fazies von den allmählichen Übergängen sind mit den schwereren und weniger mächtigen von der Umgestaltung geänderten Ablagerungen der inneren Zone der Aue verbunden. Diese Schemas der Verbreitung der Fazies von Auebodenalluvialen werden auf den verschiedenen Grundstücken einer und derselben Aue durch den Einfluss des Reliefs und der Ungleichmäßigkeit der Abtragung aus dem Flußbett in verschiedenen Punkten der Küste und die Bewegung des Auftauwassers in der Aue oft verletzt.

Ein großer Teil der Prozesse der Versetzung des Stoffes und der Energie ist mit dem Wasserwechsel verbunden und geschieht aktiver innerhalb der kleinen Stromgebieten der Quellgebiete. Es ist bemerkbar, dass dieser Typ der Landschaftsstruktur eine wichtige Stellung in der Konzeption der Bildung der leistungsfähigen ökologisch standfesten Agrolandschaften einnimmt.

Für das volle Verzeichnis des Systems der Kennziffern des Monitorings der Flussniederungsböden muss man die zu kontrollierenden Parameter erforschen. Wenn man die Besonderheiten der natürlichen Landschaften bei der Durchführung der Flurbereinigung außer acht lässt, so erhöhen sich die Anthropogenbelastungen auf die landwirtschaftlichen Ackerflächen, was zur Vergrößerung der Intensität der Bodenerosion und anderer negativer Prozesse führt.

Als wichtigste Agrarverfahren in der Erhaltung der Bodenfruchtbarkeit ist die Regulierung des Wasserregimes, das die Produktivität der landwirtschaftlichen Ackerflächen bestimmt.

Bei der Analyse des Zustandes der Flussniederungsböden vom Standpunkt des Mikroreliefs muss man als Hauptparameter des klei-

nen Quellgebietes folgende berücksichtigen: die innere Struktur, die Breite, die Länge und den Umfang des Quellgebietes, den Charakter der wassergeteilten Linie, die Dynamik des lokalen Abflusses und des Abspülens, der Zone des Nullabflusses. Nach den morphometrischen Parametern kann man über die Charakteristik der Flussniederungsböden und die mögliche Berücksichtigung die Netze urteilen.

Um über den Zustand der Flussniederungsböden eine Vorstellung zu haben, muss man folgende hydrologischen Parameter studieren: Niederschläge, den Schneebestand, Verdunstungen, den Feuchtigkeitsaustausch zwischen den Oberflächen - und den Grundwassern, den Maximalabfluss, unterirdische Nebenflüsse und des Abflüsse, den Grundwasserstand.

Einen bedeutenden und vielseitigen Einfluss auf den Boden übt die allgemeine Tendenz zum Aufstieg des Grundwasserstandes. Unter den Bedingungen der Kreise Grjasinski, Usmanski und Dobrinski existiert die Gefahr des maximalen Aufstiegs der Grundwässer. Die maximale Erhöhung des Grundwasserstandes wird auf wenig entwässerten Grundstücken mit einem flachen Relief des Geländes bemerkt.

Bei sehr feuchtem Boden, der man in den niedrigen Stellen beobachtet wird, bilden sich die Böden mit saurerem Alluvial und mit den offenbaren morphologischen Merkmalen des Hydromorphismus. Diese Böden sind für den Ackerbau wenig geeignet, sie sind sehr feucht besonders in den Niederungen, was in der Regel die Schwierigkeiten für ihre Nutzung nicht nur in feuchte Jahreszeit als auch in normale nach der Befeuchtung Jahreszeit schafft.

Für die Aufklärung der negativen Erscheinungen bei der Wassererosion, der Verschlechterung der Böden, der Grundwasserhebung, der Versumpfung, der Staunässe, der Versalzung, der Verschmutzung des Bodens wird das Wissen nicht nur der obengenannten Parameter, sondern auch einer Reihe der hydrologischen Eigenschaften der kleinen Quellgebiete gefordert.

Das Studium der Veränderungen des Zustandes der Flussniederungsböden fordert die Ausarbeitung des wissenschaftlichen und methodischen Charakters für jeden konkreten Fall unter Ausnutzung bestimmter Methoden der Forschung.

Die Hauptquelle der ökologo-hydrologischen Informationen ist das Monitoring des staatlichen Netzes Gidromet. Sein Hauptnetz erfüllt die systematischen Beobachtungen nach der einheitlichen Methodik und den standardmäßigen Geräten hinter dem Regime der Wasserobjekte, dem Wasserstand während des Hochwassers, den Kosten des Wassers und der Abtragungen, der Temperatur des Wassers, den Eiserscheinungen und der chemischen Verbindung des Wassers. Das Monitoring wird für das Systemstudium der hydrometeorologischen und hydrophysischen Prozesse und des Regimes des Einflusses der Wasserobjekte auf den Flussniederungsböden durchgeführt.

Von uns ist die Struktur des agroökologischen Monitorings angeboten. Sie schließt vier Blöcke ein.

Der erste gibt das Vorhandensein und die Qualität der Ausgangsinformationen über den Zustand von Flussniederungsböden.

Der zweite schließt die Analyse der Besonderheiten des Funktionierens und des Regimes der zu studierenden Objekte ein.

Der dritte ist auf die Analyse der Rolle der natürlichen und Anthropogenfaktoren gerichtet, die den ökologo-wirtschaftlichen Zustand der Flussniederungsböden beeinflussen.

Der vierte stellt das Steuersystem und die Kontrolle des qualitativen Zustandes von Flussniederungsböden sowie die Kenntnisse der Ergebnisse des Monitorings für die Lösung der praktischen Aufgaben dar.

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INEFFICIENCY OF AGRICULTURAL LANDS USAGE AS A PROBLEM RURAL DEVELOPMENT AND FOOD SECURITY SUSTAINABILITY.

Аннотация: В статье рассматривается проблема продовольственной безопасности страны со стороны устойчивого развития сельских территорий и неэффективного пользования земельными ресурсами сельскохозяйственного назначения, а так же предлагается возможное решение данной проблемы

At present food security is not only an indicator of the country's independence, its economic level. It also plays part in enhancing its national security from external threats. Food is nothing like the element of human life. The level of food security reflects many socio-economic factors in the country, as well as the level of the market economy of development. In this regard there is a problem of the population food security. Food supply is linked to the problems of ecology and environmental protection.

On January 30, 2010 the President of the Russian Federation signed a decree "On the approval of the Food Security Doctrine of the Russian Federation", which identified the following main provisions of national security, affecting food independence:

- provisions of the state strategy for the economic security of the Russian Federation;

- national security concept of the Russian Federation;

- food security of the Russian Federation is a factor in the preservation its statehood and independence, the most important component of population policy, necessary condition for the implementation of strategic national priorities, i.e. improving the quality of life of Russian citizens by ensuring high standards of living. [4]

In Russia rural areas occupy a large territory of the country, so their sustainable development of rural areas is the main solution of the problem of food security in the country.

Under the sustainable development of rural areas we mean sustainable development of rural communities, providing: the realization of its national economic functions (production of food, agricultural raw materials, and other non-agricultural goods and services, as well as public goods, the provision of recreational services, preservation of rural life and rural culture, social control of the territory, preserving the historical development of landscapes; the expanded reproduction of the population, the level of growth and improvement in the quality of his life, maintaining the ecological balance in the biosphere. [5]

The development of these areas implies a clash with a number of problems to be solved. The following problems should be mentioned:

- improving the quality of life in rural areas;
- provision of socio-economic stability;
- development of new legal acts and improvement of already issued;

- the protection of agricultural lands;
- updating of the agricultural land fund;
- better monitoring of agricultural land;
- effective resumption of land resources;

There are many other equally important problems. Their solution could lead to socio-economic stability and prosperity of rural areas.

Focusing on actual issues, I would like to highlight, the inefficient use of land resources and reproduction of agricultural lands. The solution of this problem has led to the changes in food security of this country and the promotion of the given Doctrine.

The concept of inefficient use of law treats only two points, which are punishable by deprivation of the right to land ownership:

1. Land owners, land users, tenants of plots from agricultural lands are required to use these plots in accordance with the purpose, in ways that should not harm the land as a natural object including land degradation, pollution, littering.

2. A plot of agricultural land can be forcibly removed from his owner in court, if has not been used for three or more consecutive years from the date of in the ownership of. [2]

Rational is such use of land, in which along with the production of economically viable quantities of products the ecological balance of natural factors maintain. For this a set of organizational, legal, social and economic factors that ensure the effective functioning of the subjects of land and legal relations in specific environmental conditions of the equilibrium temperature is to be established. [6]

Conditions and mechanisms of confiscation of land are registered in the statutes and codes. According to paragraph 2 of Art. 36 of the Russian Constitution the owner can use the land freely, if it does not harm the environment and does not violate the rights and lawful interests of other participants. [1] As the experience shows it the degradation and loss of soil fertility can be proved. The non-use of the land is very difficult to prove.

Withdrawal instrument of agricultural land may encourage owners to use their "wealth" rationally and for the benefit of the land, if to be involved. At present practice, negligent owners are punished for of with small administrative penalties land degradation that may not even partially cover the damage to soil fertility. Only isolated cases reach examination and laboratory investigations. In particular it indicates the sluggishness and low skills level of land control stuff, which is a self-important problem.

The new edition of the Land Code of the Russian Federation comes into force on January 1, 2015. The main part of the changes will concern land protection, monitoring and land surveillance. It observed more clearly defined concepts the goals and objectives of public land monitoring are observed, the powers and the principle of the sequence of the organs of the State Land Supervision are described in detail. It is important in new legislation is prescribed solution ineffi-

cient use of land. However, how will be the withdrawal of land from unscrupulous owner still remains a big question. Up till now we are guided duplicate entries in the Land Code, the provisions of Art. 6 of the Federal Law "On the transfer of agricultural land". [3]

In our view it is necessary to modify the given provisions of the Land Code and not dwell on the fact that officials can engage experts and expert organizations to conduct compliance audits of land legislation. Taking into account the above assumptions the probability of engaging an expert will be very small. Wide scale census of all agricultural land with full expert report is necessary. It will be possible to observe changes in the picture quality characteristics of land resources during their use by the owner. And in the future need to be re-verification of these characteristics of land on the main criteria are to be carried out. Obtaining the database perfect mechanism of withdrawal of land from inefficient owners we can discuss strengthening of social and economic stability in rural areas. It is important the land to be used efficiently and effectively. It should not be depredated.

In our opinion, the costs of examinations can pay off tax payments to agricultural producers, the possibility of failure of the supporting grants and subsidies to agriculture. It will be possible to carry out a but later after the launch of the above mentioned mechanism. The withdrawal must be made on a reimbursable basis, but only in case of harmless land application. In cases of degradation it is necessary to calculate the amount of land fertility recoverment and if it is less than the cost of land, then the cost difference should be paged back to the owner. If the cost of recovery will exceed the cost of land the owner gets nothing. In addition, we believe that withdrawal of land for repeated administrative violations should take place, since this option will affect fewer changes in the legislation and will not produce urgency by actualization of land fertility.

Immediately the question arises whether it is necessary to resort to such drastic measures if not the whole land potential is involved. The answer should be only positive. Land is a limited renewable resource and how it will recover depends only on its owners who are interested in its fertility preservation in the long term period for their descendants. It is therefore necessary to tightly engage the sustainable development of rural areas which will "delay" skills and potential in-

vestors from the local community in the country side, and effectively promote rural way of life that in all the developed countries little is slightly different from the city one by social demands.

Unfortunately at present many owners of agricultural land are very far from rational land use and the land is only one of the types of resources for exploitation for them.

In conclusion to solve the problem of food security in this country, it is important to legislate requirements for effective use and reproduction of agricultural land which requires:

- to revise the legal framework of land and civil legislation related to the transfer of agricultural lands;
- to develop mechanism to assess the effectiveness of the owners and tenants of agricultural lands;
- to change the staff policy in the public oversight and land control departments;
- to develop rural infrastructure more intensively.

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SYSTEM OF FOREST PLANTINGS CARE AS A WAY TO INCREASE THEIR USE EFFICIENT

Аннотация: В данной статье рассматриваются вопросы необходимости проектирования лесных насаждений, их положительные и отрицательные стороны, а также важность применения систем ухода за лесными насаждениями, для более эффективного их использования.

Ключевые слова: лесные насаждения, агротехнический уход, лесомелиоративный уход, рубки ухода, санитарные рубки.

In modern conditions green plantings are an integral part of the environment as they are the most important factor of the territory protection from various adverse effects both natural and anthropogenic.

By forest plantings we understand natural or artificial plantings which depending on the appointment can be various in forms, design, width from massive to flat.

When forming forest plantings it is necessary to consider the extent of their impact on the environment which is defined by the following factors: character of planning decisions, structure and composition of plantings, biological features of wood and shrubby breeds and density of planting. Besides it is important to pay attention to positive and negative aspects of forest plantings:

Positive aspects are that they stroke snow and promote its more uniform distribution. Wind speed decreases, humidity of the soil and

air increases and it promotes the decrease in erosive processes and according by the increase of the agricultural crops productivity.

As for the negative aspects, they are also present at forest plantings. For example, in old (high) forest plantings negative moments are both the existence of root system, and the emergence of shadows. As for the young (low) plantings they do not provide protective effect on the territory. It is also necessary to consider that the long-term service of forest plantings requires long and frequent care not only of trees, but also of the soil that involves big expenses.

Plantings density substantially has an impact on the creation efficiently of steady and durable plantings capable to carry out the functional purpose. But, in order the plantings would serve longer it is necessary to carry out certain systems of measure. So for example in the territory of Voronezh region, according to the state forest register, (January 1 2014) the total area of forest plantings makes 502.7 thousand hectares, the area of lands of forest fund being 422 thousand hectares. 90.7% of lands are covered with wood, 2.2% - agricultural lands, 7.1% are under roads, bogs, water and other lands.

The analysis and assessment of the planting state which is carried out as a result of the planned the forest pathology inspections showed that it is impossible to recognize current forest pathology and sanitary state of the woods of Voronezh region to be safe. It is confirmed by the reference of the woods to the zone of strong forest pathology threat. The area of the woods with broken and lost stability makes 47.4 thousand hectares that makes about 11% of lands of forest fund of Voronezh region. [4]

To the improve forest plantings state and stability, creation of optimum ecological conditions of growth and in general environmental protection in forest plantings it is necessary to carry out different types of care (agronomical and forest improvement).

At the first stages of formation (during defective growth of trees) the agronomical care consisting generally of destruction of the superfluous, vegetation disturbing to growth which substantially deprive forest plantings of light, moisture, food is carried out and suppress them with phytoncides. If a person does not eliminate this influence, growth of plantings is slowed down, and they will start dying off gradually. Therefore conducting agronomical care of forest plantings

is an important task for preservation of moisture and food in the soil creation of conditions for successful survival and growth of wood vegetation. In the process of plantings growth soil surface acreage lit by the sun reduces. There comes its full shadow that excludes growth of photophilous herbs and therefore there is no need for agronomical care.

Duration of the care depends on the speed of the trees growth moisture content which besides plants biological features, depends on nutrition, planting density. The average duration of agronomical care in forest plantings in many respects depends on a location. As Voronezh region, is located in steppe and forest-steppe zones the duration of agronomical care in rows and between them in both cases takes 4-6 years. In a steppe zone it can reach 10 years in row spacing.

As for the type of forest strips, the most common in TsChR: are field-protecting, flow regulating forest planting and gully. These forest strips significantly differ from each other and are projected depending on the appointment, features of agro forest fund (land relief, soil and erosive condition of agricultural lands, structure of cultivated areas). [1]

For example, if we consider windbreak forest fields (the narrowest of the above-mentioned), then due to strong side lighting they do not have complete shadow of the soil surface. All this occurs because of strong side lighting. Therefore forest strips of this look (especially without bushes) conditions for of steppe types of grassy vegetation growth often remain. In this connection there is a danger of an stephanie of forest plantings which negatively influences the growth and condition of wood vegetation (they start drying up and prematurely die off). To fight against stephanie of forest plantings it is recommended to carry out a repeated plowing of row spacing during all plantings life every year. It is more preferable to conduct it during the autumn period. For more long-term for this type of forest plantings and high-quality existence it needs high expenses only natural biological stability, but also artificial intervention is important. It is necessary to agree with this fact as the best wind-shelter properties are obtained by narrow forest strips. And as for wide forest strips (20-30 m) with a shrubby underbrush, they do not need an annual repeated plowing of row spacing and possess higher biological stability. [2]

The next type of care is silvicultural which is formed and root systems of wood plants at the beginning of the trees the period of close growth which is qualitatively new condition of forest planting. Here the influence of wood plants at each other is diverse, there is a self-thinning which, without human control, can develop in undesirable way. To avoid this it is necessary to replace natural thinning by artificial.

It is achieved by of silvicultural care by cutting down a part of wood plants cutting maintenance. As a result of the best trees of the main breed, the accompanying ones and the bushes, remain all the superfluous trees are cut down. Features of this type of the cutting are that they are carried out to create of growth favorable conditions for the main breeds, to ensure the most efficient influence of forest strips on interband fields for the improvement of crops growth.

Cutting maintenance is carried out in 3 stages, depending on the age, specific structure, density and location:

Stage I - to a full trees closing;

Stage II - formation of a necessary design of plantings;

Stage III - maintenance of a necessary design and viability of plantings.

Cutting maintenance are carried out not only for the purpose of the main breeds improvement of growth, but also for regulation of wind penetration and creation of conditions for care of the soil in row spacing. In forest strips cutting main play a double role: care of the structure and quality of forest plantings (biological role) and care of the formation and maintenance of the planting necessary design. (meliorative role).

During the maintenance it is necessary to cut down drying out, damaged, strongly oppressed, accompanying and main tree species. It is necessary to consider that cutting down has to be moderate not to allow an excessive planting sparseness and consequently the emergence of grassy vegetation in forest strips and of course the influence of harmful winds to the soil which they protect.

As for the care depending on the type of forest strip, it is necessary to provide continuous detention of drained water from slopes. In wide gully forest strips the cutting maintenance are carried out first on one longitudinal half, and in 2-3 years - on the second one. In narrow

forest strips, cutting maintenance is carried out in one step, leaving untouched an edge row which is also exposed to cutting down, but only sooner or later.

Along with cutting maintenance for the improvement of the wood sanitary during sanitary cutting condition it is also important for sanitary cutting are carried out. Taking into consideration forest strips features their merits and demerits we can choose the most important direction of the activity, and according to the objectives realize them. Today taking into the account the development of science and technology we can successfully carry out different types of forest plantings care of which are provided using special equipment and mechanisms (mechanical method), sometimes and by means of chemicals application suppressing the development of undesirable young growth (chemical method which considerably reduces work expenses in comparison with usual cutting maintenance). [3]

Today the government of the city district of Voronezh developed a set of programs to improvement of usage, protection, reproduction of forest plantings of Voronezh region [5,6,7] each of which assumes preservation of function green zones including forest plantings due to green fund reconstruction, development and the improvement of their maintenance. Thus if in 2010 the area of lands subjected to care, in the Voronezh region, was about 4 thousand hectares today it is about 8 thousand hectares. All the programs promote more careful and rational use of forest plantings.

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DIE REKULTIVIERUNG DER VERLETZTEN BÖDEN

Аннотация: В данной статье рассматривается комплекс мер по экологическому и экономическому восстановлению земель, плодородие которых в результате человеческой деятельности существенно снизилось.

Ключевые слова: рекультивация, плодородие почвы, пахотный слой.

Unter Rekultivierung versteht man die Wiederherstellung von naturnahen Lebensräumen für Pflanzen und Tiere auf so genannten devastierten Flächen, wie sie z.B.vom Tagebau hinterlassen werden. Auch alte Deponieflächen, Straßen oder bebaute Gelände können rekultiviert werden. Wichtig ist dabei vor allem die Entsiegelung des Bodens, also die Rückgängigmachung der Flächenversiegelung. Die größten Schwierigkeiten liegen darin, dass die zu rekultivierenden Böden in der Regel stark verdichtet und oft mit Chemikalien, Schwermetallen oder Öl verseucht sind.

Bei Erarbeitung von Mineralvorkommen, Torf, bei allen Arten von Bauarbeiten, geologischen Arbeiten und der Arbeiten, die mit der Oberflächenverletzung verbunden sind, braucht man das Abnehmen von der Bodenschichtkrume. Wenn man Abfälle gelagert oder Industrie und Haushaltsabfälle warden, als auch bei der Entfernung der

verunreinigten Böden ist es nötig, die Krume abzunehmen. In diesem Fall sagt man, dass es eine Bodenrekultivierung nötig ist.

Verletzte Böden sind die Böden, die ihren wirtschaftlichen Wert verloren haben, oder sie sind eine Quelle von negativen Auswirkungen auf die Umwelt durch eine Bodenverletzung, und sie sind die Folge der industriellen Tätigkeit von Menschen.

Die Rekultivierung wird auf eigene Kosten von Rechtspersonen und Bürgern durchgeführt. Darum sind die Rekultivierungsprojekte genehmigt. Dieses Thema ist in der modernen Wirtschaft sehr interessant und relevant.

Die Bodenrekultivierung ist ein Komplex der Wiederherstellungsarbeiten. Die Wiederherstellungsarbeiten sind auf den volkswirtschaftlichen Wert von Böden sowie auf die Verbesserung der Umweltbedingungen gerichtet.

Die Rekultivierungsrichtung ist die Wiederherstellung der verletzten Böden für eine bestimmte Zielverwendung.

Das Rekultivierungsobjekt ist ein verletztes Land, das eine Rekultivierung braucht.

Die Rekultivierungsschicht ist eine Bodenschicht, die in der Rekultivierungsperiode mit günstigen Eigenschaften für das Pflanzenwachstum künstlich geschaffen wird.

Die landwirtschaftlichen, forstwirtschaftlichen und andere Rekultivierungsarten sind für Wiederherstellung der fruchtbaren Bodenschicht notwendig. Die Rekultivierung hat zwei nacheinander folgende Stufen. Das sind technische und biologische Stufen.

Die technische Stufe der Bodenrekultivierung sind Planenung, Abhangsbildung, Abnehmen und Auftragen von der Krume, Einrichtung von hydrotechnischen Anlagen und Meliorationsanlagen, Ablagerung der toxischen Gesteine.

Die biologische Stufe der Bodenrekultivierung ist eine Stufe der Bodenrekultivierung. Sie besteht aus den Wiederherstellungsmaßnahmen von der Krume. Die biologische Stufe erfolgt nach der technischen Stufe. Die biologische Stufe ist ein Komplex von agrotechnischen Maßnahmen und Meliorationsmaßnahmen.

Die Renaturierung bezieht sich dagegen auf die Bodenoberflächen und Flüsse und hat im Gegensatz zur Rekultivierung immer eine naturnahe Wiederherstellung zum Ziel.

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ORGANIZATION-TERRITORIAL MEASURES FOR AGROLANDSCAPE OPTIMIZATION

Аннотация. На основе анализа современного состояния агроландшафта представлен его природный потенциал. Намечены пути оптимизации агроландшафта, основанные на проведении комплекса организационно-территориальных мероприятий.

Ключевые слова: агроландшафт, природный потенциал агроландшафта, потенциал устойчивости, ресурсный потенциал, экологический потенциал.

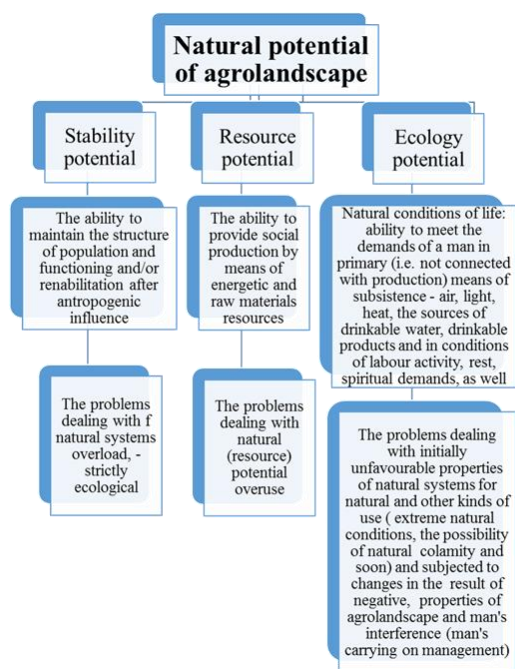
The analysis of agrolandscapes contemporary state of Voronezh region allows to conclude that necessary measures aimed at their op-

timization should be taken. Present-day level of structural organization and agrotechnical techniques influences the agrolandscapes state.

For example, according to the specialists data region humus losses in soils in Voronezh for the last 100 years were about 30 per cent of the standard supplies in average; as for arable soils the content of organic substances reduced almost 2 times. As for the erosion processes they increased up to 20 per cent during the last 20 years, and the potential of soil fertility became approximately 7-8 per cent less. Besides, the excessive ploughing up of territories, deforestation should be taken into account. As a result there are frequently repeated droughts. For example, for the first half of the 20-th century droughts were observed 7 times, for the second half – 14 times, thus every 3 years. At the same time the process of outbreak quickening of crop bests and diseases is observed. In summer in several southern areas of Voronezh region, the number of green bugs in grain crops was up to 300 per one meter {1}. The tendency towards density decrease and specific variety of flora, the useful ornitho- and entomofauna is noted.

Agrolandscape change depends on modification and its components destruction. In this connection it is necessary, to take a complex measures to optimize agrolandscape.

Let us consider the natural potential of agrolandscape. See fig.1.
Fig. 1 Natural potential of agrolandscape and ecological problems, dealing with its use.



Ecological landscape systems of farming, developed and introduced into practice are of great importance for agrolandscape optimization {2}. Transition to the new stage of ecological agrolandscapes improvement is evident and needs a very deep analysis.

To optimize agrolandscapes it is necessary to conduct a complex of organization and territorial measures in different conditions: macrolevel, mesolevel, microlevel. Macrolevel is natural agricultural area, mesolevel is regional territories (regions, provinces); microlevel is agricultural enterprise or a territory of agrolandscapes.

Let us consider microlevel of landscape optimization in detail. Its main parts are as follows:

- Optimal by structure, quantity and quality indexes system of forest melioration, agrotechnical, organization management, hydro-technical and other measures;

Elements of the given system (stabilizing objects of economic significance) must occupy not less than 10 per cent of the total area analyzed (mesolevel and microlevel);

Stabilizing and destabilizing areas of the given system must take into the account natural specifications of the given territory. They must be adapted to the local natural conditions.

Landscapes optimization will provide their stability in agricultural enterprises. This means that up-to-date anthropogenic landscapes will contain natural landscapes in their structure, be more flexible, ecological and stable to different anthropogenic load.

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THE AUTOMATED INFORMATION SYSTEMS, THEIR CLASSIFICATION. AIS OF THE STATE IMMOVABLE PROPERTY CADASTRE.

Аннотация: Автоматизация и создание информационных систем являются на данный момент одной из самых ресурсоемких областей деятельности техногенного общества. Одной из причин активного развития данной области является то, что автоматизация служит основой коренного изменения процессов управления, играющих важную роль в деятельности человека и общества

The automated information system is the interconnected set of means, methods and the stuff used for storage, processing and issue of information in interests of achievement of a goal.

Thus the automated information system (AIS) represents a set of information, economic-mathematical methods and models, technical, program, technological means and experts intended for information processing and adoption of administrative decisions.

The purpose of the work is to consider the automated information systems essence and the Automated Information System of the State Immovable Property Cadastre in particular.

The Automated Information System (AIS) is the human-machine system providing the automated preparation, search and information processing within the integrated network, computer and communication technologies for the optimization of various spheres of management operation.

The structure of AIS is made up of a set of its separate parts named by subsystems. The subsystem is a part of system chosen by any sign.

The AIS consists of two subsystems: functional and providing ones. The functional part the AIS includes a number of the subsystems

involving the solution of the specific planning objectives, control, account, the analysis and regulation operation of the operated objects. During analytical inspection various subsystems which set depends on the enterprise type, its specifics, level of management and other factors can be chosen. For normal operation of the AIS functional part subsystems of the providing AIS part (the so-called providing subsystems) are included.

Depending on the level of the enterprise process AIS or its component (subsystems) can be referred to various classes:

Class A: systems (subsystem) management of technological objects and/or processes management.

Class B: systems (subsystems) of preparation and accounting of the enterprise the production process.

Class C: systems (subsystems) of planning and analysis of the enterprise production process.

Systems of class A can be considered as classical options:

SCADA - Supervisory Control and Data Acquisition (dispatching control and accumulation of data);

DCS - Distributed Control Systems;

Batch Control - systems of consecutive management;

Industrial control system - Automated process control systems.

As classical examples of systems of a class B is possible to consider:

MES - Manufacturing Execution Systems;

MRP - Material Requirements Planning (system of planning of needs for materials);

MRP II - Manufacturing Resource Planning (system of planning of resources of production);

CRP - C Resource Planning (system of planning of capacities);

CAD - Computing Aided Design (the automated systems of design - SAPR);

CAM - Computing Aided Manufacturing (the automated systems of support of production);

CAE - Computing Aided Engineering (the automated systems of engineering design - SAPR);

PDM - Product Data Management (automated control systems for data);

SRM - Customer Relationship Management (a control system of relationship with clients);

As classical names of system of a class C it is possible to consider:

ERP - Enterprise Resource Planning (Planning of Resources of the Enterprise);

IRP - Intelligent Resource Planning (systems of intellectual planning).

On the sphere of functioning of object there are AIS:

- banks;
- financial bodies;
- firms or enterprises;
- statistics, etc.

There are following types of management processes:

- AIS of management of technological processes;
- AIS of organizational management;
- AIS of management of organizational and technological processes;
- AIS of scientific researches training AIS.

On the level of the public administration system: branch AIS; territorial AIS; interindustry AIS are exist.

AIS of the State Immovable Property Cadastre belongs to systems of class B. It is an automated control system for data and branch system in the sphere of public administration.

The automated information system of the State Immovable Property Cadastre is intended for the implementation of the state cadastral accounting of the land plots and related real estate objects procedure in the automated multiuser mode of the remote access to databases.

The purpose of AIS creation and development of the State Immovable Property Cadastre is to increase the efficiency of the made decisions referring to the land and real estate, quality of technological processes and stimulation of investment activity in the market of real estate to of satisfy of the requirements of the society and citizens.

Information on the real estate objects comes to the system by means of electronic devises, including the object coordinates. The information is carefully controlled of semantic and graphic data before introduction the object into the uniform inventory of the real estate. When introduced into the inventory data on capital construction projects is attached to data on the land plots on which they settle down. For binding the objects their coordinates are used.

Subsystem functioning is organized by means of portal technology by the Internet. Thus the common information space is created. The work with spatial and semantic data, various operators, necessary for solving the problems of the state land registry maintaining using AIS of the State Immovable Property Cadastre is carried out by browser.

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SMALL RIVERS IN THE STRUCTURE OF WATER BALANCE IN VORONEZH REGION

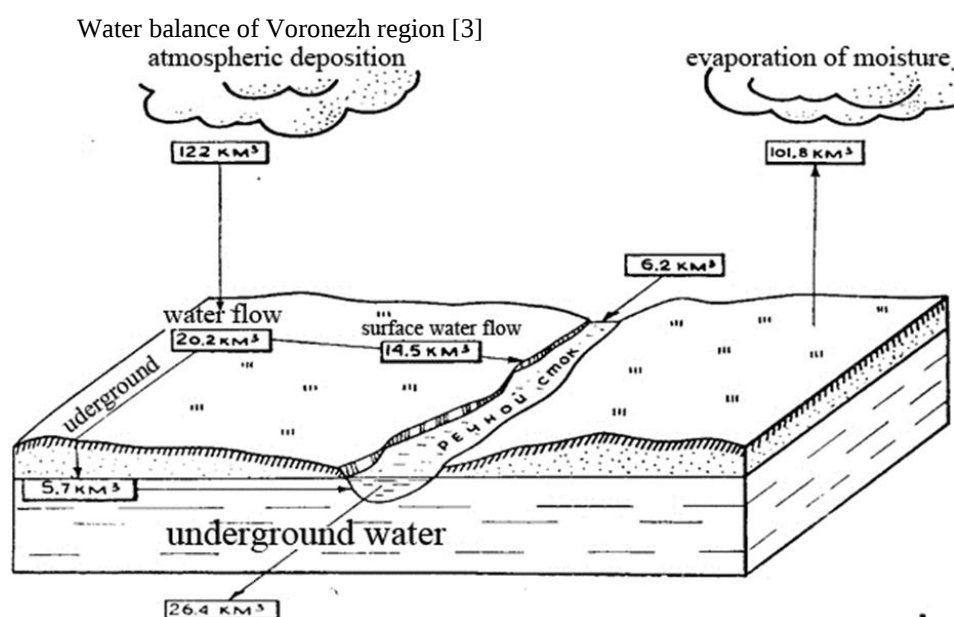
Freshwater in the modern world is a most important resource. Shortage or poor quality affects human health. Especially important it

becomes in agriculture. Water resources include rivers, lakes, marshes, ponds, reservoirs, and groundwater.

Main quantity of the surface water in our region is concentrated in the rivers.

There are 828 rivers with the total length of more than 10 thousand km. Only 233 rivers have stable water regime. The main waterway is Don River, which provides navigation between the Azov and Black seas. Supply of the surface water is about 14 km^3 . All rivers, except the Don River, dry and they are used for local water supply [1].

Voronezh region is located in the area of insufficient watering. Annual rainfall is relatively small, most of it evaporates. The share of local water resources remains about 4 km^3 . Per capita Voronezh region accounts for about 1.5 thousand m^3 of water supplies [2]. For this indicator, the region is one of the poorest in the Central Black Earth economic region, and in Russia.



Water resources are being reduced under the impact of human activities. Dwindling supplies water from global warming and its losses from the surface of the waters of the artificial lakes. Over the last 50 years a lot of small rivers and streams of the region turned into the valleys.

Small rivers with catchments area are less than $1,000 \text{ km}^2$, their waters feed the larger watercourses. Small rivers flow, if there is large supply of groundwater and water springs. Medium and large rivers in all con-

ditions remain viable. The table presents data on endangered small rivers of Voronezh region (the riverhead of Don)

Table - List of endangered small rivers of Voronezh region [2]

№ nn.	The name of the river	The length of the river	The area of water in- take, км2	Place the conflu- ence	The decrease in the length of the river from source to mouth%
1	2	3	4	5	6
1	Mechet	26	162	Bitrug	80
1	2	3	4	5	6
2	Gnilusha	25	301	Veduga	90
3	Kazinka	24	160	Don	60
4	Burovlyanka	18	134	Don	70
5	Topka	18	259	Ikorets	75
6	Smyachok	34	149	Ikorets	60
7	Rossoshka	22	181	Devitsa	80
8	Suhaya Berezovka	19	104	Berezovka	60
9	Izbishe	12	71	Gnilusha	55
10	Levaya	14	74	Tamlik	80
11	Fedorovka	28	222	Kantemirovka	90
12	Bugayevka	12	62	Kantemirovka	95
13	Gnilusha	33	304	Mamonovka	85
14	Malorechenka	32	115	Tokai	78
15	Boganka	28	597	Vorona	60
16	Chigareck	11	222	Vorona	80
17	Baklusha	42	326	Bogana	85
18	B. Griban	16	132	Vorona	100
19	Suhoy Karachan	18	157	Karachan	55
20	Ozerki	20	102	Chigla	70
21	Berezovka	22	137	Chigla	75
22	Pihovka	17	180	Savala	85
23	Tavolzhanka	21	112	Savala	55
24	Tagayka	15	73	Savala	85
25	Gryaznushka	13	64	Hava	90
26	Tamlik	57	394	Hava	60
27	Malaya Mezenka	28	170	Chernaya Kalitva	85
28	Svinuha	27	304	Chernaya Kalitva	70
29	Matushina	38	482	Don	65
	Total:	690			

The main causes of small rivers water resources depletion:

- deforestation and plowing of the steppes;
- plowing of steep slopes, gullies, ravines, floodplains; reclama-
tion works with the draining of floodplain areas and water bodies;
- the pollution of rivers by products of industrial activity;

- break of energy state the flow of water during flood due to the natural vegetation of floodplains;
- unreasonable construction of a large number of ponds, dams, reservoirs, rivers, streams and beams;
- failure to observe coastal water protection zones of water bodies

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LE DYNAMISME DU FONDS AGRAIRE DE LA REGION DE VORONEJ DEPUIS 2009-2014.

Аннотация: В наше время темпы развития во всех сферах деятельности людей довольно высоки. В погоне за временными улучшениями в повседневной жизни мы забываем или пренебрегаем о таких важных вещах как экология и рациональное природопользование, которые являются основополагающими для существования не только сегодняшнего поколения, но и будущего.

La terre est la plus importante ressource naturelle, qui assure la possibilité de l'existence de la vie. La fonction principale de la terre consiste en formation des autres milieux naturels : de l'atmosphère, de l'hydrosphère et de la biosphère, mais souvent cet aspect n'est pas perçu comme nécessaire.

Selon l'article 4 de la loi fédérale №7 sur la protection de l'environnement, la terre est l'objet de la protection de la pollution, de l'épuisement, de la dégradation, de l'endommagement, de la destruction et d'autre influence négative de l'activité économique. Le chapitre II du code agraire de la Fédération de Russie «la Protection des terres» dit que l'acceptation de n'importe quelles décisions dans la gestion des ressources foncières doit se réaliser selon la protection des terres. Ces mesures comportent les actions qui assurent la technologie de l'utilisation des terres, qui n'amènera pas à la réduction de la qualité

de la ressource utilisée. Ces travaux sont fondés sur les documents de l'étude pour définir la qualité et l'état des terres et pour élaborer des actions sur prévention et l'élimination des conséquences négatives de l'exploitation du sol.

Le changement de la surface des terres de certaines catégories se révèle en train de la précision des données réalisées selon les documents de l'inventaire des terres.

La nécessité du changement de la catégorie des terres apparaît quand on met à la disposition des terres de la propriété de l'État, pour les besoins municipaux, ou quand on fait le changement des frontières des établissements et des autres transformations des terres. Le changement de la catégorie peut se passer à la suite de la confiscation du terrain ou la protection des terres.

Ainsi, toutes les données, qui sont présentées dans le tableau 1, sont les résultats de nos recherches, du travail des organes du pouvoir exécutif de l'État et des personnes physiques et juridiques.

Selon l'information du site officiel du Rosreestr - les terres de la destination agricole en 2013 dans la région de Voronej font 4199,6 milles hectares, ce qui est moins de 6.2 milles hectares qu' en 2012. (Le tableau 1). [1][2]

Le tableau 1. Les fonds agraires dans la région de Voronej en 2009-2013.

№	La catégorie des terres en milles hectares	2009	2010	2011	2012	2013
1	2	3	4	5	6	7
1	Les terres de la destination agricole	4237,2	4237,2	4213,7	4205,8	4199,6
2	Les terres des localités	465	465	465,3	465,6	466,8
3	Les terres de l'industrie, de l'énergie, du transport, de la télévision, de l'informatique, la terre pour la garantie de l'activité spatiale, la terre de la défense et la terre d'une autre destination spéciale	65,5	65,5	65,6	66	68,2

Continuation du tableau 1

4	Les terres des territoires spécialement protégés et des objets	34,3	34,3	34,3	34,2	35
5	Les terres du fonds forestier	391,4	391,4	414,5	421,9	423,9
6	Les terres du fonds d'eau	12,2	12,2	12,2	12,2	12,2
7	Les terres de réserve	16	16	16	15,9	15,9
8	Toutes les terres dans les frontières administratives	5221,6	5221,6	5221,6	5221,6	5221,6

D'après les résultats des dernières années les terres de la destination agricole ont subi de petites réductions des places. Pour répartir les terres agricoles on fait des projets de la réglementation de l'exploitation de la terre, qui se fondent sur la nécessité de l'utilisation rationnelle des terres. Le bien-être de la population et de l'État dépend de la qualité de ces projets. Il faut prendre en considération les facteurs écologiques, géobotaniques, géologiques, hydrologiques et d'autres conditions.

Dans le rapport de Rosreestr, qui faisait le monitoring d'État des ressources foncières, on indique les problèmes négatifs suivants:

- La réduction de la superficie globale des espaces agricoles;
- La réduction des terres arrosées et drainées, l'aggravation de leur état de bonification et l'utilisation économique;
- L'accroissement du bilan déficitaire de l'humus sur le champ labouré;
- La pollution du sol par les métaux lourds, les éléments radioactifs

[1] Rosreestr fait une conclusion qu'il faut avoir, ainsi les données spatiales, systématisées et actuelles sur la terre pour la gestion plus effective des ressources foncières de la Fédération de Russie.

Il est nécessaire de fournir à la population des produits alimentaires. C'est une des plus grandes tâches de notre Etat. La préservation et l'augmentation des soles fertiles est la base des récoltes abondantes.

Selon la statistique dans les années à venir la réduction ultérieure des terres agricoles est attendue. En 2014 la réduction des terres agricoles dans la region de Voronej est égal qu'en 2009.

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УДК332.2

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Voronej, La Russie**

SUR LA QUESTION DE L'ENREGISTREMENT DES DROITS DE PROPRIÉTÉ ET DE LA LOCATION DES TERRES AGRICOLES

Аннотация: В статье, на основе анализа закона «об обороте земель сельскохозяйственного назначения» от 24 июля 2002 года, приводятся актуальные вопросы регистрации прав собственности и аренды земель сельскохозяйственного назначения.

Ключевые слова: собственность, аренда, земли сельскохозяйственного назначения.

Le président Vladimir Poutine a promulgué la nouvelle «loi sur les échanges des terres agricoles» le 24 juillet 2002 [1]. Elle couvre

l'ensemble des possibilités d'exploitation des terres, et porte sur la propriété privée individuelle ou collective, sur les procédures de transmission et de location.

Selon les données du Service Fédéral de l'Enregistrement, de l'Inventaire et de la Cartographie, pour la période allant de 2004 à 2014 a considérablement augmenté, la proportion de la propriété des personnes morales sur les terres agricoles. Par exemple, pour certains quartiers de la région de Voronej plus de 30 fois [2]. Ces tendances sont observées dans toutes les régions et exigent la recherche et le contrôle.

La propriété de la terre est un droit constitutionnel fondamental défini par les articles 35,36,71 et 72 de la Constitution. L'article 36, notamment, précise que « les citoyens et leurs associations ont le droit de posséder la terre en toute propriété » et que « la possession, la jouissance et la disposition de la terre..., sont exercées librement par leurs propriétaires, si cela ne porte pas préjudice à l'environnement, et ne viole pas les droits et intérêts légaux d'autrui ». Le dernier alinéa de cet article indique que « les conditions et modalités de jouissance de la terre sont fixées sur la base de la loi fédérale », mais le premier alinéa dispose que « les problèmes de possession, de jouissance et de disposition de la terre..., relèvent de la compétence conjointe de la Fédération de Russie et de ses sujets ». La loi foncière agricole, en se référant au Code foncier de la Fédération de Russie a tranché cette question et définit de façon assez précise les attributions respectives de l'État fédéral et celles des sujets de la Fédération.

Toutes les terres à vocation agricole sont concernées par la loi, sans distinction de statut (fédéral, municipal, régional), à l'exception de certains territoires, notamment dans le grand nord, traditionnellement utilisés en bien commun par les populations locales, et qui ne peuvent être privatisés. Toutes les opérations foncières sont accessibles aux particuliers et aux personnes morales, sans limitation de statut, de formation ou d'antériorité. La loi confirme ainsi que les dirigeants ou les structures gestionnaires des anciennes fermes collectives pourront se porter acquéreurs des terres de leurs exploitations; elle ouvre également l'accès à la propriété foncière agricole aux entrepris-

es et aux personnes physiques n'ayant aucune ascendance ou relation professionnelle préétablie avec le secteur agricole. Les banques et « agroholdings » pourront faire confirmer leurs propriétés, dès lors qu'elles s'engageront à garantir leur mise en valeur agricole, et prouver la légalité de leurs acquisitions antérieures.

Les sujets de la Fédération, ou leurs établissements publics, ont un droit préférentiel d'achat de terres mais ne peuvent participer aux premières enchères. Ils ne pourront donc pas se porter acquéreurs de terres pour reconstituer des fermes régionales au moment de la confirmation des transferts des droits de propriété [3]. Leur droit de préemption les autorisera toutefois à conserver des exploitations dans un statut de bien régional.

Les étrangers - personnes physiques ou morales - ne peuvent en principe avoir accès à la propriété privée de la terre, mais pourront prendre des terres à bail. Cette disposition restrictive a été introduite tardivement sous la pression des gouverneurs face à un projet gouvernemental cherchant à attirer des investisseurs étrangers. Les motivations des gouverneurs sont variées mais elles ont en commun un réflexe nationaliste animé par la crainte de voir s'installer des investisseurs étrangers contre lesquels les entrepreneurs locaux ne pourraient pas lutter faute de moyens financiers. Toutefois, avec la loi de juillet 2003 sur le statut de producteur individuel, les étrangers semblent pouvoir désormais, dans certaines conditions, devenir propriétaires fonciers.

Les terres agricoles doivent être gérées de façon à préserver l'ensemble de leurs aptitudes fonctionnelles, notamment au regard de la loi du 10 janvier 2002 relative à la protection de l'environnement. Dans le cas d'un constat avéré de nonrespect de ces obligations, la jouissance de la terre pourra être retirée d'office à son détenteur. Le chapitre I de la loi foncière étend aux terres agricoles l'application de la loi du 16 juillet 1998 relative aux hypothèques, créant ainsi la possibilité d'offrir aux banques la terre en garantie pour l'octroi de crédits.

La vente des terres est soumise à une obligation de publicité préalable, avec mention du prix proposé et des diverses clauses commer-

ciales. Si les pouvoirs publics n'exercent pas leur droit de préemption dans un délai d'un mois, le vendeur peut librement céder son terrain à la seule condition de ne pas abaisser le prix en dessous de la valeur initialement proposée. La mise en location des terres agricoles est limitée aux terres ayant fait l'objet d'un enregistrement cadastral. La durée des baux ne peut excéder 49 ans mais le preneur d'une terre à bail dispose d'un droit préférentiel de renouvellement à expiration du bail.

Les terres d'État et municipales seront cédées après publicité préalable par des ventes aux enchères organisées selon les règles de l'article 38 du Code foncier. Les terres d'État ou municipales peuvent être données à bail à des communautés religieuses, des organisations cosaques, des centres de recherche et de formation ou encore à des groupes indigènes minoritaires et sont alors exclues de toute possibilité de vente.

Malgré le fait que la réforme agraire se poursuit près d'un quart de siècle, et décrit ci-dessus, la loi est valable plus de dix ans, la question de l'enregistrement des droits de propriété et de la location des terres agricoles reste d'actualité.

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AGRICULTURAL LANDS USE IN VORONEZH REGION

Аннотация: В статье приводится анализ использования земель сельскохозяйственного назначения за 2014 год на территории Воронежской области, даны предложения по повышению уровня оформления земель сельскохозяйственного назначения

Ключевые слова: земли сельскохозяйственного назначения, государственный кадастровый учет, регистрация прав, категории земель, общедолевая собственность.

According to the state land records total area of arable land within the administrative boundaries of Voronezh region on January 1, 2014 amounted to 5221.6 thousand hectares.

As a result of the reforms and land redistribution changes for certain categories of land took place in the structure of the land fund for the fiscal year.

Area of arable land totally decreased by 7.9 thousand hectares and increased by 0.1 thousand hectares as for the lands at the expense of the reserve [1].

The decrease in agricultural land has occurred in connection with the inclusion of this category in settlements, as well as the transfer of land plots from the category of agricultural land industrial land were included to the data of the annual report for 2014, based on the data of the State cadaster and the state registration of rights. Changes of land category of forest areas that was previously included in the category of agricultural land. They were reflected in the report in the category of forest land as the property of the Russian Federation.

Settlements area increased by 0.3 thousand hectares due to agricultural land (0.2 thousand hectares) and protected areas and objects (0.1 thousand hectares). Land area of industry increased by 0.4 thousand hectares due to the transfer from the category of agricultural

land. The area of land of the protected areas and facilities decreased by 0.1 thousand hectares due to the land transfer to settlements. Forest land area of increased by 7.4 thousand hectares due to the transfer from agricultural land. The land area of water resources has remained unchanged. The area of land reserve decreased by 0.1 thousand hectares due to transfer to agricultural land.

Agricultural lands in the area is dominated and by January 1, 2014 are 4205.8 thousand hectares or 80.5% of the total land area. Agricultural lands are distributed among economic partnerships, companies, production cooperatives, including farms and other agricultural organizations and agencies and are intended for agricultural production. Economic partnerships and companies, cooperatives, state and municipal unitary agricultural enterprises, research and educational institutions and establishments, which provided land for agricultural production, scientific research and educational purposes, as well as farms, other companies, organizations and institutions at the same time are recorded agricultural lands. Number of businesses on agricultural lands was 5173 enterprises including 1.452 companies, organizations, enterprises, companies engaged in the production of agricultural products and 3721 (peasant) farms.

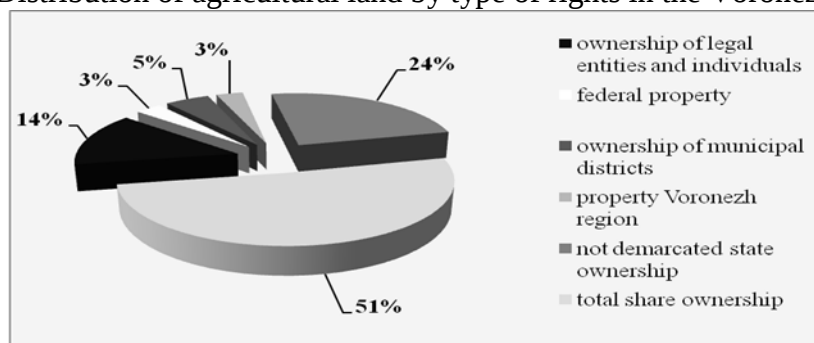
In the area most of the agricultural land is arable land is 3811.6 thousand hectares (90.6% of the total land area in this category), including: arable land – 2.906 thousand hectares (69.1%), grasslands - 838 6 thousand hectares (19.9%), deposit 31.6 thousand hectares (0.8%) and perennial plants 35.4 thousand hectares (0.8%).

Non-agricultural lands which are represented by buildings and structures, internal roads, communications, land intended to serve agricultural production are also included in the structure of agricultural lands. Their area is 394.2 thousand hectares (9.4%), including: for reclamation construction - 2.8 thousand hectares, forest land and forest plantations outside the forest fund - 167.9 thousand hectares, water bodies - 31.2 thousand hectares, construction sites - 24.4 thousand hectares, roads - 34.7 thousand hectares, marshes - 26.8 thousand hectares, breaking ground - 0.4 thousand hectares and other lands not used in agricultural production - 106 thousand hectares [1].

As a result of the inventory of agricultural land (February 5, 2014), total area of agricultural land in Voronezh region is 1.61 million hectares, including agricultural land 1.10 million hectares, which is 68.1%. The largest share of agricultural land falls on arable land and is 0.78 million hectares [3].

It should also be noted that of all the agricultural lands of Voronezh region, about 51% are in general share property (Figure 1).

Figure 1 - Distribution of agricultural land by type of rights in the Voronezh region

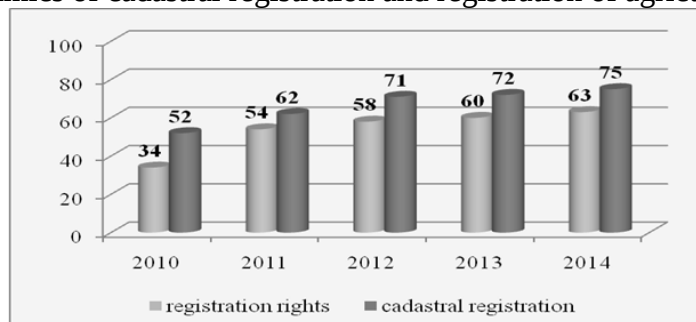


77% of the total area of agricultural lands is included into the cadastral registration. As for the municipal districts a significant difference in the value of this parameter is observed. For example, in Anninsky area are 98% of agricultural lands and in Semiluksky - only 53% are included into the cadastre registration.

Rights (ownership, lease) on the land plots of 0.87 million hectares, which is 67%, are registered in the Federal State Statistics Service of Voronezh region. According to this index, there are significant differences among the regions. Khokholsky district is lagging behind with a value of 38% of the index, and prosperous is Kamensky at a value of 84% of the index [2].

Dynamics of state cadastral registration of land for agricultural purposes, as well as registration of rights to them for the last 5 years is presented in Figure 2.

Figure 2 - Dynamics of cadastral registration and registration of agricultural land,



Due to the low level of registration of agricultural land it is necessary to intensify the work with individuals and legal entities on land formulation in the state cadastre and registration of the rights in the Rosreestr of Voronezh region, which will prevent the emergence of conflicts.

Currently the Russian Federation continues the reduction of agricultural lands, lands deterioration, soils fertility decrease. Soil cover loses resistance to degradation, resilience properties and reproduction of fertility, as well as prone to degradation and pollution. Agricultural land use is extremely inefficient. Accounting and inventory of land, land management and land conservation are not properly implemented.

High level of valuable land attrition from agriculture is the cause of the negative socio-economic factors the disappearance of rural settlements, the reduction of rural population, and the decline in gross product. For this reason, the overriding objectives are the conservation of productive agricultural land, optimization of arable land and souring acreage on quantitative and qualitative characteristics.

The solution of these tasks is connected to modernization of connected technologies of supporting and increasing the productivity of agricultural land, land use, land protection, creating organizational and legal mechanism of agricultural land management. Efficient solution to these problems is based on the modern information on the status and use of agricultural land resulting from the development of the system of state monitoring of land and formation of the state information resources.

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***Секция VII. Актуальные вопросы гуманитарных и
юридических наук.***

Section VII. Topical issues of law and humanities.

УДК 355:94

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**FEATURES OF THE WAR ECONOMY OF THE USSR AND
NAZI GERMANY: SOME SIMILARITIES AND
DIFFERENCES**

Аннотация: В статье показаны основные, на взгляд автора, особенности военной экономики СССР и фашистской Германии, а также некоторые наиболее существенные сходства и различия двух милитаризованных экономических систем периода Второй мировой войны.

Ключевые слова: военная экономика, экономика фашистской Германии, советская экономическая система во второй мировой войне.

The economy of the belligerent countries, including the USSR and Germany of the 1930s – middle of the 1940s. undoubtedly has some obvious similarities and unconditional differences that distinguish these different in their ideological spirit militarized economies.

Certain scientific and general cognitive interest is the determination of the uniqueness of the Soviet and German economies which were forced to serve military purposes of the belligerent countries. So what were the main and essential features of the Soviet economy during the Second World War:

1. The militarization of labor and the economy as a whole, the translation of the civil economy on a war footing.

2. Full nationalization of the national economy as a whole, the complete elimination of private property and the private sector.

3. Development of the Soviet war economy in a "single military services" (1939-1945).

4. Formation of "Stalinist command economy", serves as a framework of social reproduction in the USSR during the war.

5. Direct and strong influence of state institutions on the evolutionary process of economic development, such as institutions of state planning.

6. Large mobilization capabilities of the centrally-planned economy, its role in strengthening the military-economic potential of the USSR during the Second World War.

The main and essential, in our view, features that had the German economy in the years of the Second World War were:

1. Growth of state regulation of economic life under monopoly of the capitalism and international markets helped by the First World War, the general economic crisis of the 1930s, World War II.

2. There is the development of a European war economy in a "single military services" (1939-1945).

3. Various forms and methods of state regulation of the economy during the wartime.

4. The presence of a sufficiently weighty and influential private sector economy and the economy as a militarized economy of Germany.

5. There is the dependence of the Nazi state plans from more or less independent German private ownership.

Firstly, we can see the domination of public ownership of the means of production in the USSR as a result of the transformations that have taken place in all areas of public life before the war. Basic means of production: factories, land and so on, all this became the property of the whole nation. In these circumstances it becomes a leading nationwide interest, and it is on its priority satisfaction was directed all production activities and public resources [1].

Secondly, the economy of the USSR even during the war developed systematically. This means that it constantly, consciously regulated in accordance with the national strategic economic plan. On the basis of the unified state plans allocate and reallocate material and human resources, established economic proportions were determined

by the leading industry. State plans, even in time of war, were developed on the basis of objective economic laws.

The war had an impact on the mechanism of action and the use of objective economic laws, but the war could not cancel them. Economic laws are modified in war. They reflect the ties that arise in the economic system of a society under the influence of the war [2].

During the World War II the entire economic life of society was achieving victory over the enemy ("Everything for the front! Everything for the victory!") [3]. There are some affects of the processes of production, distribution, exchange, consumption, and the laws of their development. Features of the mechanism of using economic objective laws during the war were reflected in native plans, forms of organization of public production, farming methods, methods of distribution, manufacturing and personal consumption, and so on.

In general, the war economy had similarities and defined differences in the countries with the capitalist and socialist economic mechanism. Socialist economic mechanism allowed the Soviet Union to have a more effective military economy than it has been in countries with fascist and democratic regimes. In the fully state-owned economy of the USSR all economic resources were aimed at the achievement of victory through military maximum results economics. All personal resources and forces of the people were to use in order to fight the enemy.

In the German economy private resources, including people who were mobilized for the needs of the war economy, were used but not with the absolute inclusiveness, as it was in the Soviet economy [4]. In Germany, there was no such sacrificial patriotism and desire to stand against the enemy, protect and defend their homeland as it was in the Soviet Union. But this is more spiritual and moral factors of the victory, rather than economic, although the Soviet people, indeed, gave all its available wealth, we can say, the last property, the time and effort to win this war for survival.

Comparison of the two economic systems - the Soviet economy and the economy of Nazi Germany during the Second World War - gives us reason to believe that there has been some kind of similarity and the general features of the two military economies of the warring countries. However, in spite of the maximum effect of wartime econ-

omy, which was, of course, a common phenomenon, and there have been serious differences in the method of organization of military and civil production, the economic mechanisms and the type of economic system. The Soviet economy was fully state-owned, based on state property, which was not only in the hands of the state, but also was managed centrally [5].

We believe that the Soviet economy in the late 1930s - early 1940s was unable to function as capitalist economy because there were no foundations of a market economy. There was no longer private property, there was no competition between private enterprises, there was not the market pricing. In the USSR acted command economy of the Soviet type, with its own advantage before the market economic system, the individual elements of which were partly present in the economy of the Third Reich, even in the middle of war [6].

Centralized distribution of the Soviet state its available economic resources, characteristic of administrative-command system of economy, as well as the presence of the vast territory of the USSR with a rich resource base, labor enthusiasm of the whole society and the people are the economic factors that led to the mobilization of all available types of resources to fight the enemy in order to achieve victory in a brutal and bloody long war. World War II was the war on the depletion of the resources.

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TEACHING TRANSLATING SKILLS IN THE FIELD OF PROFESSIONAL COMMUNICATION

Аннотация: В настоящее время интегрирование России в мировое сообщество привело к увеличению потребности переводчиков в сфере профессиональной коммуникации. Специалист в сфере профессиональной коммуникации для успешной деятельности должен обладать определенным набором компетенций, таких как лингвистическая, семантическая, межкультурная и переводческая компетенция, а также определенными умениями, которые рассматриваются в данной статье.

Ключевые слова: лингвистическая компетенция, семантическая компетенция, межкультурная компетенция, переводческая компетенция, текст, переводчик в профессиональной сфере

In the educational process of translators' training readiness of a student for the translational work is shown in availability of such competences as *linguistic, semantic, interpretive, text and intercultural*. Performing of base translational actions is impossible without formation and development of these competences.

The semantic competence represents ability to mobilize the system of knowledge, skills and intellectual qualities necessary for extraction, storing and generation of sense. The given competence allows perceiving and keeping the semantic contents of the message in memory, allocating its semantic units and uniting them in larger ones.

Formation of primary translational skills is promoted by development of *the interpretative competence*, which means the ability to mobilization of the system of knowledge and skills necessary for revealing of contextual value of language means and their transformation, basing on verbal ability and heuristic skills. The given competence allows a translator to transfer, formulate and reformulate the sense of the message on native and foreign languages according to the context, to select corresponding synonymic means to transfer the sense. This competence is the basic parameter of mastering of a language.

The text competence supposing ability to mobilize system of knowledge and the skills, necessary for text activity, consisting in distinction of the type, the genre, and the style of the text, and also in designing and reproduction of the text according to the set typology is not less significant for formation of translational skills.

Development of *the intercultural competence* becomes one of the important purposes. Being the basic condition of the intercultural communication, *the intercultural competence* consists in advanced ability to mobilize the system of knowledge and skills necessary for decoding and adequate interpretation of the sense of speech and non-verbal behavior of representatives of different cultures and orientation in a socio-cultural context of a certain communicative situation. For the translator it means to prevent or compensate misunderstanding of the members of the intercultural dialogue and to promote their interaction. The listed components of the professional competence of a translator provide the further self-development and self-improvement of a young specialist as a professional.

The growth of scientific, economic, cultural contacts and an increasing store of technical information are stimulating the demand for specialists of different professions knowing foreign languages.

At present Russia is integrating into the world's community and the need in translators/interpreters is growing in demand.

Some years ago both language and non-language higher educational institutions received the right to prepare specialists who together with their profession could get the additional qualification "Translator in the Field of Professional Communication". Departments provide training translators/interpreters of business documentation, technical, scientific and economic texts. The program is popular with students of technical institutions of higher learning as it gives better opportunities

for their professional careers. English proficiency today means better job opportunities, higher salaries and prospects for promotion.

Nowadays translation is a field of application not only of linguists, interpreters, teachers of foreign languages but also of engineers, mathematicians, civil engineers, architects, economists, etc.

Teaching translating skills constitute an integral component of intercultural communication and cross-cultural education. The presentation focuses on the development and improving of translation skills for special purposes. In spite of some recent innovation in the field of ELT Methodology the problem is far from being solved.

The chief difficulty in translation is that of changing from grammatical and lexical mechanism of the native language to that of a foreign language. We attempt to analyze and suggest possible solutions for the problem, and to develop the skills needed to acquire and use technical information.

Professional literature is characterized by usage of a great deal of terms, abbreviations, certain types of grammar structures. Dealing with professional literature it is necessary to have opportunities to precisely transfer the terms into the native language. Terms present a certain difficulty when they have no exact equivalent to corresponding Russian terminological system.

Terms can be divided into: simple (e.g. pilaster); complex (e.g. scaffold-bootleg); word-group (e.g. pilaster face; mushroom slab). Among translation techniques are: word-for-word translation (e.g. sky-scraper; multistoried)-translation by means of the genitive case (e.g. road making); translation with the help of prepositions (e.g. epoxy mortar); descriptive translation (e.g. high alumina cement, needle-beam underpinning); explaining abbreviations (e.g. maxcap - maximum capacity; sigma - shielded inert gas metal arc welding).

Teaching translating skills should start with the word order. Stages of teaching technical translation are as follows:

- Read the text (paragraph) and try to guess its contents.
- Divide composite sentences into separate parts.
- Define the predicate and the subject of the main and subordinate clauses.
- In every clause find the predicate group, the subject group and the object group and start translating with the subject group, then - the predicate group and finally - the object group.
- Only after that look out new words in the dictionary. Look

through all meanings and choose the most appropriate to the content.

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PROBLEMS OF EDUCATION IN THE MODERN UNIVERSITY

Аннотация: Проблема воспитательного процесса в высших учебных заведениях стоит довольно остро. Это связано с высоким уровнем разобщенности в понимании современной картины мира, как у студентов, так и у преподавателей. Необходим многоаспектный социологический анализ предметных областей воспитательного процесса для развития во взаимоотношениях со всеми социальными структурами общества.

Ключевые слова: образование, воспитание, воспитательный процесс, студенчество, преподаватели.

Today the problems of education came to one of the leading places in the minds of the citizens of Russia, along with issues of eco-

conomic, political and social development of the country, ensuring its national security⁵

The life of modern students depends on many factors and is not easy. The study involves overcoming organizational, psychological, emotional and other difficulties. Some young people come in higher educational institutions with wrong ideas about University life. Some come with illusions, some with great conceit, some to "extend child" and "lay of the army". In state educational policy of Russia in the first decade of the XXI century solution to the problems younger generation upbringing acquires additional complexity in the face of the continuing economic and socio-cultural crisis, causing an apparent worsening of the youth social well-being of youth and reducing the level of social optimism and activity population.

The education at the University often means purposeful systematic activities closely related to learning that focuses on the formation of socially significant qualities, attitudes and value orientations of the person. The strategic goal of education is generally considered as the transition from disparate educational measures to the creation at the University of humanities (social and cultural) raising environment as forming the base of the educational activity at the University.

L.I. Shumskaya formulates a number of conceptual conclusions on the basis of scientific research on the education of students. First, the education seems to be a deliberate process of socialization and is an integral part of the united educational process. Secondly, the contemporary notion of education is based on personal and cultural basis: promoting the full development of personality in the uniqueness of the image by joining social life the culture in all its aspects: moral, civil, professional, family, etc. Thirdly, education is an interactive process in which positive results are driven by the efforts of both parties - both teachers and educated. Finally, the education process should be based on the trends and features of personal manifestations of students, as

⁵ *Шайденко Н. А.* Воспитание студенческой молодежи в педагогическом вузе // Педагогика. 2010. № 6. С. 44–50.

well as the specifics of personal significance for the person microenvironment⁶.

To create favorable living conditions for the students, they need to achieve high-quality professional education adequate to their needs. It is necessary to overcome a number of stereotypical views on the implementation of education at the University. First of all it concerns the "selection" of the educational process from the general flow of pedagogical processes, limiting its functional role as an extra in relation to education, hinder proper "educational process"⁷.

A teacher in Russia has always been a tutor, but today education can and should be understood not as a transfer of experience and judgement from the older generation to the younger generation, but as the cooperation of teachers and students in the field of joint academic and extra-curricular activities.

The beginning of the XXI century is marked by the appearance of the great diversity of educational in the higher educational institutions. In other words, the "onslaught" of new socialization means that in relation to young people educational system strengthens its prestige, and youth subculture is focused on education and the acquisition of specialist status (their contradictory relationship has specific characteristics). However, the student spiritual world largely develops on the background of prevailing in modern Russia pragmatism, concerns first of all the material problems that poses an obvious confusion of youth⁸.

In the field of education numerous conflicts that develop due to the lack of understanding by teachers of students who otherwise adapting to changing social conditions still remain. The real situation is that participant when the training process does not know what to offer each other, because their views and attitudes are correlated with different social systems assessments.

⁶Шумская Л. И. Проблемы воспитания студенческой молодежи // Адукацыя і выхаванне. 2000. № 5. С. 57–61.

⁷Сидорова И. А. Воспитание на основе сотрудничества // Высшее образование в России. 2009. № 7. С. 79–82.

⁸Щенникова Л. С. Духовные ориентиры псковских студентов // Социологические исследования. 1999. № 8. С. 98–100.

Today intergenerational conflict "teacher-students" is ambiguous: on the one hand, most of the students respect higher school teachers are in the eyes of students «uninvolved» in a new social structure, "failure" in the changed reality (which correlates with the students higher score the students of 'culture' and simultaneously a low assessment of its role in the achievement of career and material success)⁹. For a significant part of students education is a compulsory system, the following of the standards and goals leads mostly to life failures.

Thus, trends in the development of the educational process in the conditions of a modern Russian society are multifunctional transforming character, modifying the traditional approach to education as the transmission of socio-historical experience, systematic formative influences on personality within the boundaries of the traditional links of socialization.

According to M. Heidegger, relevance is the ability to "pre-wait" within the boundaries of the present moment that can come tomorrow¹⁰

Today a dynamically developing society constantly introduces changes amo between people communication the section of the report to UNESCO for the XXI century «Education: a hidden treasure" - "Civil education and practical participation in civil life", which refers to the need to provide civil education as an elementary polychromatic culture", is not limited to formal education, taking into consideration that family and other members of the society should participate in the educational process¹¹.

On the one hand, this confirms that the issues of education are universal and modern information (open) society in comparison with Russia is radically "advanced" in the formulation of educational activity. On the other hand, remains a common belief that the development of democracy in a natural way leads to a reduction of the up-

⁹ Филоненко В. И. Студенчество современной России: парадоксы существования. Ростов н/Д: Изд-во ЮФУ, 2009. 314 с.

¹⁰ Хайдеггер М. Семинар в Ле Торе, 1969 // Вопросы философии. 1993. № 9. С. 127.

¹¹ Образование: сокрытое сокровище : докл Междунар. комиссии по образованию для XXI века. Бельгия : Imprimerie Europa, 1997. С. 64–65.

bringing process (because we are talking about the impact on the person who should develop freely and independently) remains. At the same time the problem of upbringing is once again being considered as additional to the training that emphasizes the need for a comprehensive sociological approach to its analysis. In fact we are talking about looking for the money value of the behavior programming of people, enriching its social nature of the dominant ideas modernizing public life. On this basis, the Russian social science activates the search for new subject areas of the upbringing process. Special role of civil community and content development in a new relationship with all the social structures of society is revealed within this process.

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MAKING USE OF THE RESOURCES OF FICTION AT THE ENGLISH CLASS (FOR STUDENTS OF NON-LANGUAGE FACULTIES)

Аннотация: В статье рассматриваются перспективы и возможности использования информативного и выразительного потенциала художественного текста на изучаемом языке в условиях преподавания иностранного языка на специальных факультетах неязыкового ВУЗа. На примере текста рассказа Хемингуэя «Кошка под дождем» показано, как в ходе выполнения конкретных пред- и послетекстовых упражнений и заданий может быть осуществлено создание коммуникативной среды и порождение коммуникативно состоятельного учебного общения, активизирующего познавательные и творческие способности студентов.

Ключевые слова: Коммуникативный подход, предтекстовые задания и упражнения, послетекстовые задания и упражнения, подтекст, повествовательная форма.

Communicative approach in teaching presupposes, technically, building up such an environment in the classroom in which a foreign language (particularly, English) would be used as the tool for verbal interaction, in other words, serve as means of information exchange. Therefore, both selecting material for such interaction (in “Teacher – Group” mode, as well as in “Student – Student” and “Student – Group” modes) and planning the class itself (forms and types of class activity, choice and distribution of tasks and exercises) should pursue the needs of natural communication: asking for and getting information, shaping up one’s opinion and attitude to the opinions of other interlocutors.

It should be admitted, though, that a non-language faculty teacher's choices of full-value communicative methods are considerably limited. The curriculum and subject planning make it impossible to separately develop individual language aspects (universally known as speaking, writing, listening comprehension, reading and use of the language). It is also understood, that under the conditions of Agricultural University (such as number of students and technical disability to differentiate them according to their competence level) the traditional and in many regards dated text-oriented approach remains unrivalled, which results in students reading and learning by heart standard topical texts to accumulate what is considered "topical" vocabulary, and later retelling or translating them to demonstrate the skills required and abilities developed. In its turn, this decreases student's motivation and lowers their overall language competence.

On the other hand, considering text as lexical-grammatical "base" for communicative activity may be productive, provided that work on the given text is properly organized.

What must be done, then, that the text in a foreign language be functionally communicative, and that its communicative nature determines the course of the class activity? It is essential, that the text be viewed upon and used as speech product possessing the plane of content and form – that is, having a subject and message, as well as appealing to the individual reader, both ethically and aesthetically. Any speech sample, regardless to its genre or style, possesses what can actually become subject to interpretation and expressing one's own opinion.

Fiction is especially applicable, as its ideas and language may be critically analyzed and actively reproduced in a new speech situation, both while interpreting the content ("Explain what the writer/character means by saying...", "Why does A behave in that way, and B – the other?", "What image does the writer create in the episode/scene?" etc.) and as structural part of prepared ("Comment on the following idea...", "Prove /disprove the following..." etc.) or spontaneous ("Agree or disagree...", "How would you behave in the shoes of...") speech.

We suggest some tasks and exercises here, that are to make use of the communicative potential of fiction in a foreign language in order to create environment for information exchange and activate students' lexical and grammar skills. The material is Hemingway's famous short story "Cat in the Rain", that we consider prospective for academic purposes regarding its phenomenal unity of fairly simple language and intense artistic consistency).

Text-oriented activities are traditionally divided into pre-text and after-text ones. The first category are supposed to have students drawn into the informational context of the speech sample they have to get acquainted with, and their cognitive activity focused on concrete aspects of information that are to be understood and furthermore serve as base for verbal interpretation. The second category are to be used for checking the understanding of the text, letting students develop their analytical abilities, and, finally, creating context for communication in a foreign language on the topic and problems raised in that text.

Here is a sample pre-text task, which aims at having students' attention focused on structural-compositional properties of the text, activates the prediction, and right from the first stages of academic interaction shift the emphasis to content (that is, to give primary importance to *what* the writer is trying to convey):

Before you read the text look through the following sentences and try to guess what the story might be about:

1) The American wife stood at the window looking out. Outside right under their window a cat was crouched under one of the dripping green tables. – ***At the beginning of the story.***

2) The wife went downstairs and the hotel owner stood up and bowed to her... Liking him she opened the door... It was raining harder. The table was there, ... but the cat was gone. – ***In the middle of the story.***

3) "...And I want it to be spring and I want to brush my hair out in front of the mirror and I want a kitty and I want some new clothes". "Oh, shut up and get something to read". – ***At the end of the story.***

4) The maid held a big tortoiseshell cat pressed tight against her... The padrone asked me to bring this for the Signora. – ***The end itself.***

That task, if performed adequately, not only provides for anticipation of the plot, main events and characters interrelations, but, what is more important, “tunes” students’ cognitive abilities on perceiving the relation between the verbalized and implied information in the text. Indeed, in the work of prose viewed upon (as in all Hemingway, in fact), the main drive in conveying the writer’s point – and that is exactly what our students should base their speech activity on, – is *the subtext*, the information hidden “behind the lines”. The set of characters is extremely narrowed: an American couple staying in an Italian hotel, the hotel-owner, the maid, and, of course, a cat in the rain. The descriptions are very word-saving, dry, almost direction-like, as well as the remarks characters swap – laconic, unaffectionate, as if compiled from all possible commonplaces (like «You look pretty darn nice», «You will get wet» etc.). What the main matter actually is, comes out of the montage of details, shows itself through words half-said and looks half-made, with rain-drops falling down indifferently on terrace tables, runs monotonously through the text with author’s remarks like «she said», «he asked» etc., is seen in repetitions and parallel structures, or gets revealed in respectable, but formal manners of the “padrone” and face of the maid, shrinking at the sound of English speech. This main matter is, naturally, the indifference, alienation, depth of human solitude and shallow wishes never fulfilled

The following after-text tasks and exercises are to help students (both intellectually and technically, that is, through use of certain vocabulary and grammar) to actually speculate on the described properties of style of narration and general scope of the writer’s ideas:

I. Memorize the following words and reproduce the situations in which they are used:

Gravel path, padrone, crouch, dim, tortoiseshell.

II. Give the English equivalents for:

- 1) мокрые от дождя зеленые столики;
- 2) поклониться, поздороваться;

- 3) манера;
- 4) чертовски хорошо выглядеть.

III. Translate into English:

1) Море разделилось полосой дождя на две части. Волны, скользя вниз к берегу, возвращались снова в морскую пучину, вновь и вновь преломляясь длинной полосой дождя.

2) Когда она говорила по-английски, горничная непроизвольно кривила лицо.

3) Ее сердце сжалось в маленький комочек.

4) Мне нравится так, как есть.

5) Дождь капал на пальмовые деревья.

IV. The questions for discussion:

1) Describe the weather.

2) What were the relations in this young family?

3) What was the attitude of padrone to a young woman?

4) Describe the feelings of a young woman who didn't see the cat.

5) Why did the maid bring the cat to "Signora"?

6) Compare the descriptions of the cat in the beginning and in the end of the story. What is different? Why?

Thus, the informative and expressive potential of fiction in a foreign language may and ought to be used in accordance with the principles of communicative approach. This is to be achieved, as shown above, through optimal distribution of language, semi-speech and speech tasks and exercises which, on the one hand, prepare students for perception and procession of information, and, on the other hand, motivate, direct and integrate their text interpreting activity at the class, where students come to take place of a subject of educational process and creatively apply language skills in the situation of individual speech production.

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REALISATION OF KEY PRINCIPLES OF COMMUNICATIVE LANGUAGE TEACHING (CLT) IN ELT COURSEBOOKS

Аннотация: Эффективность обучения иностранным языкам во многом определяется качеством учебных материалов, основным из которых является учебник. В статье рассматриваются проблемы реализации основных принципов коммуникативного подхода в современных учебниках английского языка. Особое внимание уделено вопросам содержания, смысловой целостности и индивидуализации учебника.

Ключевые слова: методика, учебник иностранного языка, коммуникативный подход, принципы.

The teaching-learning experience is mainly comprised of three essential entities: the students, the teacher, and the instructional materials. One of the most commonly recognized and used forms of instructional materials are the ELT coursebook (CB). The CB offers structured content in a uniform format for ready implementation.

Since a great many CBs have, for some time, laid claim to a ‘communicative’ methodological approach the following question needs to be asked: To what extent does the (inherent) methodological approach embody key tenets of CLT?

The principles of communicative language teaching (CLT) have been stated in different ways by Widdowson [6], Savignon [4], Nunan [3] and others.

Concerning the "position" of CLT Holliday stresses its developmental nature in order to dissociate it from the “serial” methods that

pre-date it: "The serial view sees communicative language teaching as just another method to be considered amongst all the others. A developmental view, on the other hand, sees the advent of communicative language teaching as an important breakthrough ... Once this breakthrough is appreciated, it is no longer possible to go back to choose an earlier method if communicative language teaching does not appeal. What is needed is a further development of the communicative approach" [1, 166].

"Language system" is essentially a reference to interlanguage, an important feature of second language acquisition, defined by Lightbown and Spada as having characteristics of the learner's first language, characteristics of the second language, and some characteristics that seem to be very general and tend to occur in all or most interlanguage systems. Interlanguages ... change as learners receive more input and revise their hypotheses about the second language. [2, 201].

The challenge that "interlanguage systems" present is that input does not necessarily result in uptake, as an emphasis on controlled practice. Hence authentic, developmental CLT is based on "meaning-focused" interaction.

Consequently, the main question in regard to this discussion is how the principles of authentic CLT can best be incorporated in teaching materials. This needs to be understood in the light of the need for teachers to make a host of decisions affected by a range of considerations. Such considerations include student profiles, learning-style variation, affect, motivation, and other contextual concerns such as class sizes and macro and micro cultural (ethnic, social, institutional,) factors [1].

Key pedagogical challenges of the 'communicative' CB can be discussed in relation with the identification of three categories through which to assess its potential effectiveness: conceptual organization, meaningful integration, and personalization.

A useful starting point is meaningful integration, a way of identifying (the possible lack of) a cohesive, unifying principle behind the staging of CB unit content. Without a proper realization of adequate tasks meaningful integration of teaching-learning staging and se-

quencing will be difficult to achieve. As a result, the ‘parts’ of a CB unit may not add up to a satisfactory ‘whole.’

Meaningful integration can be found where each stage of a teaching-learning ‘unit’ contributes to and facilitates the following one; or consolidates or expands on the preceding stage(s). And where a pivotal communicative stage based on task performance is the focal point, toward which the preceding stages build, and after which the subsequent stages provide follow-up. This creates a ‘whole’ integrated with its ‘parts,’ in turn integrated with each other. It also provides a clear organizational sequence on which to base CB unit content.

Underpinning this is conceptual organization, which is concerned with the type of syllabus employed, curricula assumptions, and considerations of approach.

White identifies with CLT the functional / notional syllabuses [5]. Since functions / notions are a means of dividing and categorizing language, this identifies them more with the linguistic than the real world. Though clearly, they are an attempt to move away from the abstract realm of language as system (Chomsky) to the actual world of transaction and interaction.

However, for the learner who may not be extrinsically or intrinsically motivated a given function may not be particularly meaningful or interesting in itself. ‘Real-world’ subject categories, therefore, are a more effective basis for conceptual organization in the form of ‘topics.’ They are more inclusive and comprehensive than functions or notions, allowing expansion of themes and greater potential content variation, resulting in greater potential for contextual adaptation.

Ideally, topics for use in ELT should have the same interest-value as they would if exploited in the students’ own native language, as intrinsically worthy of consideration.

In the EFL situation in Russia, where there is little need for students to speak English outside the classroom, choosing appropriate topics is essential for enhancing students’ motivation to participate in class.

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SELF ASSESSMENT FOR ESL STUDENTS

Аннотация: В статье рассматриваются способы самоконтроля работы студентов, изучающих английский язык как иностранный. Самоконтроль работы студентов основывается на трех базовых элементах: постановка цели, выполнение упражнений под руководством преподавателя и критерии оценки.

Ключевые слова: Образовательный процесс, самоконтроль, критерии оценки, портфолио, ответная реакция, мотивация, цели обучения, контрольная работа.

One of the ways in which students internalize the characteristics of quality work is by evaluating the work. ESL students can become better language learners when they engage in deliberate thought about what they are learning and how they are learning it. In this kind of reflection, students step back from the learning process to think about their language learning strategies and their progress as language learners. Such self assessment encourages students to become independent learners and can increase their motivation.

The successful use of student self assessment depends on three key elements: goal setting, guided practice with assessment tools.

Goal setting is essential because students can evaluate their progress in English more clearly when they have targets against which to measure their performance. In addition, students' motivation to learn English increases when they have self-defined, and therefore relevant, learning goals.

One way to begin the process of introducing ESL students to self-assessment is to create student-teacher contracts. Contracts are written agreements between students and instructors, which commonly involve determining the number and type of assignments that are required for particular grades. Contracts can serve as a good way of helping students to begin to consider establishing goals for themselves as language learners.

ESL students do not learn to monitor or assess their learning on their own; they need to be taught strategies for self monitoring and self assessment. Techniques for teaching students these strategies are parallel to those used for teaching learning strategies. The instructor models the technique; students then try the technique themselves; finally, students discuss whether and how well the technique worked and what to do differently next time.

In addition to checklists and rubrics for specific communication tasks, students can also use broader self-assessment tools to reflect on topics they have studied, skills they have learned, their study habits, and their sense of their overall strengths and weaknesses.

ESL students can share their self-assessments with a tutor or in a small group, with instructions that they compare their impressions with other criteria such as test scores, teacher evaluations, and peers' opinions. This kind of practice helps students to be aware of their learning of English. It also informs the teacher about students' thoughts on their progress, and gives the teacher feedback about course content and instruction.

Portfolios are purposeful, organized, systematic collections of student work that tell the story of a student's efforts, progress, and achievement in specific areas. The student participates in the selection of portfolio content, the development of guidelines for selection, and the definition of criteria for judging merit. Portfolio assessment is a

joint process for instructor and student. Portfolio assessment emphasizes evaluation of students' progress, processes, and performance over time. There are two basic types of portfolios. A process portfolio serves the purpose of classroom-level assessment on the part of both the instructor and the student. It most often reflects formative assessment, although it may be assigned a grade at the end of the semester or academic year. It may also include summative types of assignments that were awarded grades.

A product portfolio is more summative in nature. It is intended for a major evaluation of some sort and is often accompanied by an oral presentation of its contents. For example, it may be used as an evaluation tool for graduation from a program or for the purpose of seeking employment.

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DIE WICHTIGSTEN METHODEN DES FREMDSPRACHENUNTERRICHTS

Аннотация: В данной статье рассматриваются основные методы преподавания иностранных языков в неязыковом вузе: грамматико-переводной метод, аудиолингвальный и аудиовизуальный методы, коммуникативно-ориентированный метод и смешанный метод. Применение всех вышеуказанных методов в совокупности является залогом успешного обучения студентов иностранным языкам.

Ключевые слова: методы преподавания, грамматико-переводной метод, аудиолингвальный и аудиовизуальный методы, коммуникативно-ориентированный метод, смешанный метод, обучаемые, процесс обучения, содержание обучения, образцы, лексический и грамматический материал, тренировать учебный материал.

Die historische Entwicklung des Fremdsprachenunterrichts lässt sich durchaus an der Aufeinanderfolge von Methoden ablesen. Auf die in den Unterricht eingeführten sogenannten neueren Sprachen (Englisch und Französisch) wurden zunächst die Methoden des Unterrichts in den alten Sprachen (Griechisch und Latein) übertragen. Gleichzeitig wandelnden sich Anforderungen an den Fremdsprachenunterricht, die „lebenden Sprachen“ so zu unterrichten, dass sie schriftlich wie mündlich auch außerhalb schulischer Aufgabenstellungen verwendet werden können, wandelten und wandeln sich auch die Methoden. Sie nahmen und nehmen häufig auf, was zuvor vielleicht von den vorausgegangenen Methoden vernachlässigt wurde und gingen und gehen ein auf aktuelle Bedürfnisse der Gesellschaft. Zudem berücksichtigen sie neueste Ergebnissen der unterschiedlichen Bezugswissenschaften.

Deutsch als Fremdsprache ist von dieser Entwicklung der Methoden des Fremdsprachenunterrichts nicht auszunehmen. Für Lehrende ist die Kenntnis der Grundzüge von Methoden notwendig und nützlich. So ist es möglich, Lehrwerke von der jeweils zu Grunde liegenden Methode her einzuordnen. Methodenkenntnis erlaubt es, für die jeweilige Zielgruppe, deren Fähigkeiten und die vorgegebenen Lernziele die geeignete Methode(das Lehrwerk) bzw. den möglichst besten methodischen Weg auszuwählen.

Der Begriff Methode/Methodik ist aus dem griechisch-lateinischen Wort *methodos/methodus* abgeleitet und bedeutet etwa: Zugang/Weg, der zu einem bestimmten Ziel führt.

Man unterscheidet folgende wichtigste Methoden des Fremdsprachenunterrichts: die Grammatik – Übersetzungs-Methode, die audiolingualen/audiovisuellen Methode, die kommunikativ- pragmatisch-orientierten Methode und die vermittelnde Methode.

1. Grammatik – Übersetzungs – Methode

Die Grammatik – Übersetzungs – Methode wurde vom altsprachlichen Unterricht (Latein, Griechisch) übernommen und auf den Unterricht moderner Fremdsprachen übertragen.

Der Unterricht nach der GÜM besteht aus 3 Phasen: aus der Einführungsphase, in der Grammatiklehrstoff präsentiert wird; aus der

Übungsphase, in der Sätze zum Grammatiklehrstoff gebildet werden; aus der Anwendungsphase, in der das Lesen, das Schreiben und das Übersetzen als Anwendung des Lehrstoffes geübt werden. Im Vordergrund steht das Lernen grammatischer Regeln, die über Beispielsätze zur Bildung korrekter Sätze führen. Überwiegende Übungsformen sind grammatisch korrekte Ergänzung von Lückensätzen bzw. grammatisch orientierte Umformungen und Übersetzungen.

2. Audiolingual/Audiovisuell Methode

Laut dem Universalwörterbuch Duden werden die Begriffe audiolingual und audiovisuell folgenderweise definiert: *audiolingual* [zu lat. *audire*=hören und *lingua*=Zunge]:[im Sprachunterricht] vom gesprochenen Wort ausgehend; *audiovisuell*: zugleich hörbar und sichtbar. Im Bezug auf Sprachunterricht geht es im ersten Fall um den Einsatz der Tongeräte wie z .B. Kassettenrecorder, CD-ROMs, im zweiten Fall um solche Medien wie Videorecorder, Audiokurse mit Lehrbüchern, Computer.

Bei der AL/AV- Methode wird der natürliche Spracherwerb gefördert. Das Ziel der AL/AV- Methode ist die Entwicklung des Sprachkönnens.

Charakteristische Übungsformen der AL-Methode sind:

- Satzmusterübungen
- Satzschalttafeln/Substitutionsübungen
- Lückentexte/Einsetzübungen
- Auswendiglernen und Nachspielen von Modelldialogen

Die AV-Methode stellt eine Weiterentwicklung der audiolingualen Methode dar. Der Unterrichtsprinzip der AV-Methode besteht darin, Sprache, wo immer möglich, mit optischem Anschauungsmaterial zu verbinden. Zu den Unterrichtstechniken der audiovisuellen Methode gehören:

- Präsentation eines Bildes oder einer Bilderfolge und eines auf Tonband aufgenommenen Dialogs.
- in der zweiten Phase werden die Bedeutungen einzelner Gesprächseinheiten erklärt
- in der dritten Phase müssen die Dialoge durch mehrfaches Wiederholen von Bild und Text auswendig gelernt werden

- in der vierten Phase werden die Lerner aufgefordert eigene Dialoge zu den Bildern zu machen

- in jeder Stunde werden Satzmusterübungen durchgeführt

Ein Vergleich von audiolingualer und audiovisueller Methode bezüglich ihrer methodischen Verfahrensweisen lässt deutliche Parallelen erkennen. Ebenso wie die ALM legt die AVM vorrangig Wert auf die gesprochene Sprache, sie verwendet einfache Modelsätze zum Üben einzelner Satzstrukturen, lässt die verschiedenen Dialoge auswendig lernen und verwendet technische Hilfsmittel im Unterricht.

3. Kommunikativ – Pragmatisch – Orientierte -Methode

Die kommunikative Methode möchte den studentenzentrierten Unterricht. *Nach einer Phase der Stoff-Faszination und der Konzentration auf Objektivierbare und mit objektiven Testverfahren messbare Lernziele im Bereich der sprachlichen Systeme ist für den gegenwärtigen Stand der Diskussion eine stärkere Hinwendung zum Lernenden als dem Subjekt des Lernprozesses und zum Lernprozess selbst kennzeichnend.*

Der traditionelle Frontalunterricht wird durch variable Formen der Einzel-, Partner- und Gruppenarbeit erweitert. Im Fremdsprachenunterricht müssen die Bedürfnisse der Lerner berücksichtigt werden. Auch die Lehrerrolle wird neu gesehen. Der Lehrer ist eher ein *Helfer im Lernprozess* und kein *Medientechniker* mehr. Die behandelten Themen sollen den Lerner betreffen machen. Er soll zum Fremdsprachenlernen motiviert werden. Es wird von dem Erfahrungsvermögen des Lerners ausgegangen. Die Inhalte sollen dem Lernenden etwas bedeuten. Sie sollen ihm helfen, sich in der fremden Welt zu orientieren und dabei neue Perspektive auf die eigene Welt zu entwickeln.

4. Vermittelnde Methode

Darunter wird eine Methode verstanden, die Prinzipien und Elemente aus geschlossenen, strikten Methodenkonzepten auswählt und miteinander mischt. Bei der Auswahl spielen die Kriterien der Anwendbarkeit und der Bewährung in der Praxis eine zentrale Rolle.

Dabei wird in Kauf genommen, dass Begründungen und Ableitungen für Teilziele und Teilbereiche des Sprachunterrichts nicht stimmig sind und sich teilweise widersprechen (z.B. kognitive Be-

gründung des Spracherwerbs/ ausschließliche Verwendung von imitativen Übungsformen oder Erklärung des Zweitspracherwerbs in Analogie zum Mutterspracherwerb/Verwendung zweisprachiger Erklärungsverfahren und Übungen).

Standards der vermittelnden Methode sind:

- Orientierung an geistig-formalen Bildungskonzepten (simples Kellner-Deutsch reicht aus)
- hoher Stellenwert des Grammatikunterrichts (nur über Wissen kann Können erreicht werden; vom Beispiel zur Regel)
- der Grammatikunterricht verläuft in zyklischen Progressionen(vom Elementaren zum Spezifischen)
- hoher Stellenwert des Literaturunterrichts (Textanalyse/Reflexion über Texte“)
- Orientierung an pragmatischen Lernzielen (wichtig ist die Verständigung in Gesprächen)
- Betonung von dialogischer Kommunikation(Alltagskommunikation)
- Beachtung des Prinzips der aufgeklärten Einsprachigkeit (das Verstehen muss gesichert werden)
- Bevorzugung frontaler Unterrichtsformen(der Lehrer muss Könnens- und Wissenserwerb kontrollieren)
- Berücksichtigung von die Selbständigkeit der Lernenden fördernden Unterrichtsformen (die Eigentätigkeit des Lernenden muss gestützt werden)

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THE USE OF PODCASTS IN LEARNING FOREIGN LANGUAGES

Аннотация. Статья посвящена использованию учебных подкастов в изучении иностранного языка. В ней автор дает определение «подкасты, »«учебные подкасты», раскрывает основные цели использования подкастов на занятиях по иностранному языку, определяет достоинства подкастов в изучении иностранного языка.

Ключевые слова: ИКТ; подкаст; учебный подкаст; коммуникативная компетенция; Веб 2.0.

New Internet technologies have allowed looking at ways of learning a foreign language in a different way. With their help, it became possible to create conditions not only for quality but also for an interesting way to learn a foreign language. One of the ways is to use podcast. It is one of the most popular services of the Internet Web 2.0 of a new generation.

A Podcast can be defined as a media file that is freely available for download from the Internet. This file is then played on a personal computer or mobile device at the listener's convenience. This media file may be just audio, audio enhanced with graphics (quite often slides from a presentation), or full video. In fact, a Podcast can be any type of file, but the most common are audio and video files. Podcast files are created by individuals and companies on computer systems with the appropriate hardware and software—which can be as minimal as a way to record sound—and then uploaded to a server that al-

allows visitors to download the file. These servers often provide a list of available Podcasts, called episodes, to special software that can read the server's feed. A very popular reader of these feeds is iTunes, which can automate the download of Podcasts and help to synchronize the downloaded files between a computer and a removable device, such as an iPod.

Training podcast - it's audio or video created by students (students) in a foreign language in accordance with the language and thematic content of the curriculum , and podcasts hosted on the server for later use in the educational process . In the classroom, a Podcast can be a lecture, presentation, announcement, audio book, or any kind of supplemental material facilitating the educational goals of the teacher and students. It can be created by an outside entity, the teacher, the students or any combination thereof.

Podcasts enable students and faculty to share information with anyone at any time. Absent students can potentially get a recorded lecture of a given class or simply use the podcast to review lecture materials for study. Podcasting can be used to support book discussions, vocabulary/language lessons, music performances, interviews, debates, or even presentations with embedded slides. These are all excellent academic uses of podcasting technology.

Podcasts can be used for several educational purposes. Here are some of them:

- Podcast are great alternatives for delivering research content or lessons to students who need remedial or extended support
- Students can create their own podcast to share their learning experiences with each other and also with other students from other schools
- Teachers can record audio podcast to provide additional and revision material to students to download and review at a time that fits them the best.
- Podcast can hugely benefit auditory learners and help them in their learning
- Creating podcast allows students to develop several important skills such as researching, writing, speaking effectively, solving problems, managing time, grabbing attention and improving their vocabulary.

- Learning podcasts can submit the following requirements: language record - foreign; Total playing time - Up to 4 minutes; subjects - in accordance with the thematic content of the curriculum; record type - a monologue / dialogue / group record; recording format - audio / video.

- Students can work on their own or in groups to create podcasts. These podcasts could serve as the culminating activity for projects. The posted projects can then be used in other class activities such as peer critiquing.

- Post student compositions (performance of music compositions, recitation or performance of written works)

- Peer critiquing of student work. Student podcasts can be evaluated by peers using online forms for gathering the postings and displaying them, either privately to the creator of the work, or publicly to the entire class.

- Record online radio programs

- Record oral Histories: With an iPod and a voice recorder, students interview relatives about their life histories, and then combine the audio interview with family photos in an iMovie project.

Podcasts are similar to e-mail messages in regards to their creation and consumption. They are built around the idea of ‘convenient for me, convenient for you’. This means that I can create a Podcast when I want and on a topic I want. You can then listen to that Podcast if you wish, and you can choose the time to do so. You are not required to be online at a given time. You can choose to listen a week, month, or even year after I’ve created the Podcast. In the classroom this is valuable for repeated use of material, from day to day or semester to semester, and it allows you to match the timing of the presentation to the content of your curriculum. You are also not forced to listen to the entire episode. You may want to be selective regarding what you present to your classes. Once downloaded to your computer or MP3 player, the Podcast can be started anywhere, as well as paused, restarted and stopped at your discretion. The Podcast can also be made available to each student individually if they have Internet access, either from school or from home.

Podcasts provide several advantages to teachers, students and parents. The points made above all support the list of advantages be-

low, which is certainly not all inclusive and is growing as Podcasts become more prevalent in our educational systems.

1. Meet the needs of more students with varying learning styles and aptitudes.
2. Provide ‘make up lectures’ to students who were absent.
3. Supplement existing material and resources with a portable and remotely accessible source of information.
4. Audio benefits vision impaired students and non-native speakers.
5. Ability to replay and review information helps to embed lessons in memory.
6. Asynchronous consumption allows for convenient access and multi-tasking (riding the bus, walking, working out, etc...).
7. Flexible curriculum pathways to encourage student participation and facilitate success.
8. Most appropriate presentation of spoken/audio material—e.g. native language, foreign language, speech therapy, music, reading assistance.

Podcasts in English are not just listening activities for students to improve their conversation. The worksheets and transcripts provide valuable English language lessons and improved learning opportunities for those who learn English and teach English at all levels.

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PROJECT ACTIVITY AS AN INNOVATIVE TECHNOLOGY FOREIGN LANGUAGES STUDYING.

Аннотация: В данной статье рассматривается понятие проектная деятельность и проводится ее классификация по типологическим признакам. Выделяются этапы работы над проектом, и подчеркивается важность использования телекоммуникационных проектов в практике обучения иностранным языкам.

Ключевые слова: Проектная деятельность, телекоммуникационные проекты, учебно-познавательная деятельность, языковая среда, языковое общение

The term "project" (projectio) means thrown forward, acting. It is translated from Latin. Project activity is the integrative kind of activity synthesizing cognitive, value orientation, converting, educational, communicative elements, and what is more important it includes students' creative activity.

According to E.S. Polat, project-based learning is the set of methods and operations of mastering a certain area of practical or theoretical knowledge in a particular activity. It is the way of organization of the process of knowing [1].

For students, it is an opportunity to do something interesting in a group or on their own, making all efforts. It is an activity allowing proving themselves, to try their hand, to put their knowledge, to benefit and to show reached results publicly. It is the activity directed on the solution of the interesting problem formulated by students as the purpose when the result of this activity is practical and it has an important applied meaning and what is more important it is interesting and significant for students.

The development of creative abilities can decide the following tasks:

- to teach students to think diversely;
- to teach them to find solutions in non-standard situations;
- to develop originality of cogitative activity;
- to teach students to analyze the problem situation from different sides;
- to develop thinking properties.

She carries out classification according to the following typological signs:

- the dominant method in the project or an activity: research, creativity, role-games, information, practice-oriented;
- subject and substantive area: the mono project (within one area of knowledge) and the intersubject project (two or more subjects; it is more often performed in unsociable hours);
- nature of contacts: the projects which are carried out in the same group; the projects organized within the same university; regional (the projects organized between universities, groups within the same region and country); international (the dialogue of cultures is realized here);
- the number of project participants (personal, pair, group);
- project duration (short-term - 1 lesson, a maximum of 3 - 6 classes; average duration - 1 - 2 months, long-term - up to a year).

Presentation of the results depends on the type of a project. So creative project results are often defended in the form of a video movie, a joint newspaper, a composition, and a role-playing game. Information project results can be presented in the form of articles, abstracts, reports, videos, and also publications including the Internet.

There are some working stages on the project. So, O. I. Zinchuk calls the project – "Five P" as she defines the following organization stages of the project activity.

- problem. The teacher at this stage explains the purposes of the project and motivates pupils, and pupils reveal problems and discuss a task.
- planning. It is formulated tasks, information is specified.
- information search. There is a research that is work to information.
- product. Pupils make collective introspection.

- presentation. At this stage the project is defended and its results are collectively estimated [2].

The international telecommunication project should be noted in practice of training of foreign languages because they create the natural language environment and the need for language communication is formed with their help. Besides, real conditions for cross-cultural communication are created. The educational telecommunication project is "the joint educational, research, creative or game activity of students organized on the basis of computer telecommunication, having a common problem, the purpose, the coordinated methods, the ways of activity and aimed at achieving of a joint result of activity".

The telecommunication project is carried out in several stages. First of all students together with the teacher define a project subject. There is work on language at a preparatory stage. Over time students learn lexical and grammatical material for its further use in project work. Traditionally, students are encouraged to learn the rules of correspondence with foreign partners. Organizational stage involves the search for partners that can carry both teachers and students themselves.

It is necessary to notice that today there is a huge number of the organizations promoting the international cooperation in the Internet. And it is easy to find the partner for carrying out the project. The list of mailing of PH-TEACH@solar.rtd.utk.edu is organized for teachers and lectures. The site www.learn.org and the list of mailing of IECC have a particular interest; they are specifically designed for teachers who are looking for partners for telecommunication projects.

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THE USE OF MULTIMEDIA IN TEACHING ENGLISH

Аннотация: Процесс модернизации современного образовательного пространства связан с интенсивным внедрением современных компьютерных технологий и мультимедийных средств в организацию обучения английскому языку с целью подготовки квалифицированного, компетентного, владеющего своей профессией, способного к постоянному профессиональному росту специалиста. Мультимедийные технологии занимают первостепенное место в формировании и развитии иноязычной коммуникативной компетенции у студентов, которая является на сегодняшний день основной целью в изучении английского языка. Использование различных видеоматериалов, художественных фильмов, мультимедийных программ, специально подготовленных для учебного процесса, электронных учебников, мультимедийных справочников позволяет создать коммуникативную среду для обучения, развить интерес к изучению языка, создать условия, максимально приближенные к реально речевому общению на иностранном языке при отсутствии естественной языковой среды.

Ключевые слова: английский язык, мультимедийные технологии, коммуникативная компетенция, процесс обучения, мотивация, эффективность.

With the spread and development of English around the world, it has become an important means of communication among the people of different cultures and languages. At present, the role and status of English are higher than ever. As a number of English learners are growing up, different teaching methods have been experimented to see the effectiveness of English language teaching. The use of technology in the form of films, radio, TV and tape recording has been there for a long time. The modern language teachers have new challenges and

duties given by the new era. The tradition of English teaching has been drastically changed with the remarkable development of newer technologies such as multimedia technology. Multimedia, is the combination of various digital media types such as text, images, audio and video, into an integrated multi-sensory interactive application or presentation to convey information to an audience. The technology makes teaching interesting and productive because it has capability to attract the language learners.

The traditional teaching methods are unpopular and less effective in the English language classrooms. Now, multimedia technology, with the help of audio, visual and animation effects, motivates the students to learn English quickly and effectively. It is hard to achieve the goal of learning English language through the traditional teaching because it hampers the students' capacity to understand the structure, meaning and function of the language. Such teaching method makes the students passive recipients of knowledge. But, now, multimedia technology has been a great help to integrate teaching and learning and provides the students greater incentives.

The use of multimedia technology breaks the monotony of traditional class teaching and is enjoyable and stimulating. For example, the use of PowerPoint template activates students' thinking and the capacity to comprehend the language. Its audio and visual effects help them to transform English learning into capacity cultivation. It creates a positive environment for the classroom activities such as group discussion, subject discussion and debates, which can offer more opportunities for communication among students and between teachers and students. Thus, multimedia technology encourages students' positive thinking and communication skills in learning the language.

The utilization of multimedia technology provides the students with more information than textbooks, and helps them to be familiar with cultural backgrounds and real-life language materials, which can attract the students to learning. The learners not only improve their listening ability, but also learn the culture of the target language. Having the abundant information through the use of multimedia technology, the students can be equipped with knowledge about the culture of the target language. This brings about an information sharing opportunity among students and makes them actively participate in the class ac-

tivities that help the students to learn the language more quickly and effectively.

The main purpose of using multimedia technology in language teaching is to promote students' motivation and learning interest in the English language. In the non-native English speaking context, this can be a practical way to get them involved in the language learning. To achieve this goal, the language teachers should create a favorable environment for English language teaching, which should be based on the availability of information and teaching materials. While using multimedia technology in teaching if students are not too dependent on their mother tongue, they should be motivated to communicate with each other in English. The process of English learning should be more student-centered and less time-consuming. The language teachers should maintain the students' communicative competence through multimedia technology. The utilization of multimedia technology can fully improve the students' thinking and practical language skills. This will ensure and fulfill an effective result of English language teaching.

However, it is important not to overuse multimedia technology. If it is used properly in teaching, the students can be able to make full use of listening and speaking materials and develop their overall language skills. Thus, the language teachers should introduce both traditional teaching instruments and multimedia technology to English language teaching so that the students can have the overall training on their listening, speaking, reading and writing skills.

In conclusion, multimedia technology plays a positive role in improving activities and initiatives of students and teaching effect in the classrooms.

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**THE QUALIFYING SIGNS OF MURDER AND ITS
DELIMITATION FROM INFLICTION GRIEVOUS
BODILY HARM ENTAILED DEATH BY
INADVERTENCE**

Аннотация: В данной статье рассматриваются понятие и признаки убийства, повлекшего по неосторожности смерть человека, и разбирается объективная и субъективная сторона преступления. Проводится классификация убийства согласно теории уголовного права.

Ключевые слова: Убийство, потерпевший, умышленное причинение тяжкого вреда здоровью, уголовное право, уголовная ответственность, прямой и косвенный умысел,отягчающие обстоятельства.

Any crime always causes a public attention, and such offence as murder has a double interest because ruthlessness, cruelty and inhumanity are shown in such action.

Murder is intended infliction of death to other person (to Art. 105 p.1 of the criminal code of the Russian Federation).

Under the concept of manslaughter gets at least a dozen varieties - from murder in a fight to the sacrificial murder.

Signs of murder are violent death, wrongfulness of the offence encroaching on other person's life and causing it death. According to this sign murder differs from manslaughter. Murder is always ex-

pressed in illegal deprivation of other person's life. The request for murder from other person (for example, an incurable patient or a person having intolerable bodily suffering) doesn't exclude responsibility for this crime. If you accidentally cause death, we are dealing with an accident, nothing more.

The public relations protected by the criminal law to which socially dangerous act harms or poses a threat of causing such damage are the object of the crime according to criminal law. The object of life is murder. And life is not only a biological process, but also social. A.N Krasikov claims that the offender, who committed the crime, encroaches, first of all, on human rights, and not on the social relations that are intended to protect the right. So he asserts that direct object of murder encroachment is "the right for life" while at bodily injury is "the right for health"[1].

The objective element is the outer side of socially dangerous infringement and it includes socially dangerous act of the subject (action or inaction); criminal consequences (result); causal relations between the act and the criminal consequences; place, time, way, tools, means and environment of the crime. Murder from the objective side represents socially dangerous act (action or inaction) causing death to other person. Murder can be committed both by act of commission and by omission.

According to the law, the subject of a crime is a "criminally liable person or" the person, who committed a crime. In the theory of criminal law the subject of a crime is the person who has reached the age established by the law and the responsible natural person who committed illegal socially dangerous act. Only the natural responsible person who has reached a certain age can be the subject of a crime. However, age and sanity are not among *corpus delicti* signs, and they are only conditions of criminal responsibility. Age and sanity are only subjective conditions of criminal liability. Criminal law accused the offender not for that he has reached a certain age and is sane but for commission of a crime provided that he has reached a certain age and is sane. Age and sanity are explained by that any act including the murder committed by juvenile or insane person, doesn't exclude its public danger, and only eliminates criminal liability. According to the para. 2 of Art. 20 of the Criminal Code of the Russian Federation the

criminal liability for murder provided by Art. 105 comes from 14 years, and for the murders provided by Art. 106, 107, 108 comes from 16 years. Establishment of lowered liability for murder (Art. 105 of the Criminal Code of the Russian Federation) is quite justified as this crime represents socially-dangerous act which is clear to each teenager.

The subjective aspect of a crime is an inner side of *corpus delicti* which defines person's mental activity at the time of the crime. The main feature of the subjective aspect of any crime is the guilt. The guilt is a person's mental relation to commission of a socially dangerous act, provided by the criminal law and to its socially dangerous consequences in the form of intent or imprudence. It is also necessary to mention about criminal intent. It is direct and indirect. At direct intention the murderer is aware of public danger of his act or omission, foresees an opportunity or an inevitability of socially dangerous consequences (death of the victim) and wants such consequences (p.1, Art. 25 of the Criminal Code of the Russian Federation). At indirect intention the murder is aware of social danger of his action or omission, foresees the possibility of socially dangerous consequences (death of the victim), doesn't wish, but consciously allows these consequences or is indifferent to them (p. 2, Art. 25 of the Criminal Code of the Russian Federation).

Incorrect content understanding of criminal's intent leads to the fact that bodies of preliminary investigation and courts don't distinguish between murder and intentional infliction of serious bodily injury which caused death of the victim (p. 4, Art. 111 of the Criminal Code of the Russian Federation). These crimes are absolutely identical on the basis of the objective part so there is a difficulty of such restriction. Sometimes it leads to the fact that acts of guilty caused serious bodily injury led to death are regarded as a murder and vice versa.

Differentiation of murder from grievous bodily harm which led to death of the victim must be carried out by mental state. At murder the guilty intent is directed on deprivation of the victim's life, but at commission of crime, provided p. 4, Art. 111 of the Criminal Code of the Russian Federation, guilty attitude to the victim's death is careless. When deciding on the direction of the intention of the guilty It is necessary to base on all the circumstances of the offense and to take into account the method and crime instrument, number, nature and location of bodily injury (e.g., vital organs injured person), as well as the pre-

vious behavior of the guilty and the victim, their relationships while deciding the question of guilty intent.

There are the second and the first degree murders in the theory of criminal law. Murders in a quarrel, in a fight, based on revenge, envy, evil will, hatred arising on the basis of personal relations; at the request of the victim and others belong to second ones.

The first degree murder. This is the homicide committed in aggravating circumstances, an exhaustive list of which is given in p. 2, Art 105 of the Criminal Code. All qualifying signs of murder are located in a certain sequence according to corpus delicti elements: on the object (more precisely on victim's identity signs,) (pp. "a" - "d" ,p. 2, Art 105 of the Criminal Code); on the objective side (the method) (pp. "d" - "g" p.2, Art 105 of the Criminal Code); on the subjective side (the motive and purpose) (pp. "z" - "m" Pa 2 of Article 105 of the Criminal Code).

One aggravating circumstance is quite enough to convict the first degree murder. The presence of two or more aggravating circumstances requires murder qualification according to p.2, Art.105 of the Criminal Code, indicating each of them.

Scientists identify one more type of murders - privileged. This is the murder with extenuating circumstances: the murder of a newborn child by its mother (infanticide) (Art. 106 of the Criminal Code), murder committed in the heat of passion (Art. 107 of the Criminal Code), murder committed in excess of necessary defense (Art. 1, Art. 108 of the Criminal Code), murder committed in excess of measures necessary for detention of criminal (p. 2, Art. 108 of the Criminal Code).

At qualification of murder, it is necessary to delimit it from related offence, for example, from infliction of grievous bodily injury which entailed death. When the person inflicts bodily harm, this crime offence directs on bodily injury but when the person commits a murder, it directs on human life. These crimes differ on object and sometimes it is possible to set the object of encroachment only on the subjective side, on the intent direction which focuses on person's bodily injury or deprivation of other person's life and this is the main criterion of crime differentiation considered in the article.

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PROBLEMATIC OF THE YOUTH'S SPIRITUAL CULTURE AT CURRENT SOCIETY DEVELOPMENT STAGE

Аннотация: Школьный возраст крайне важен в формировании духовной культуры личности, потому что образ жизни ребенка, весь строй его мыслей и чувств формируют его личность, причем в силу особой восприимчивости детского возраста, формируют активнее, чем это будет происходить, когда он станет взрослым. Любые пробелы в развитии, любые пустоты имеют невосполнимые последствия для личности.

Ключевые слова: духовная культура, духовность, нравственный компонент, эстетический компонент, духовно-нравственное воспитание.

The problematic of spiritual culture and its values is among global issues of the modern age. The issues of a man's moral growth, their ethical culture establishment, formation of a system of values based on humanitarian consciousness are extraordinary of interest at this time.

While thinking over destinies of a man and mankind in the constantly changing world many scientists concentrate their efforts on spiritual and ethical origins in regard to social interactions as a basement of humanization, human values priority in the social relationships system [1].

Socially based subject related to culture studying consists of pedagogic impact conditions studying of socio-cultural environment that influence spiritual orientation of a person capable of self-development and self-fulfillment of their own abilities in a society.

In the meantime such an important factor in the spiritual culture formation of a teenager as an ability of finding, defining and solving a problem is still unclear in many aspects. The issue of the youth values formation depending on their education environment and specific character of cultural integration is not yet well studied.

These issues make it necessary to define socio-cultural education problems leading a researcher to search those factors that are the most important in the process of spiritual qualities formation of a person.

It is also essential to emphasize the fact that makes the study even more up-to-date - the socio-pedagogical conditions of a spiritual culture formation of a person in environment interactions.

The meaning of the word "spirituality" is of an ancient origin, having many roots in the science and culture history. The ancient philosophy considered spirituality as a theoretical activity that, for example, Aristotle called thinking about understanding.

During Middle Ages the individual spirituality demonstration was related to God. Since a human according to the religious conception hold a position between the Earth and the unreachable higher being, their self-enrichment level was defined by the approaching the higher being and separating from the sinful physical world.

Renaissance gave rise to a new approach to the spirituality that "praises human personality and considers it as a center of cosmic beauty, the perfect example of the world's harmony" according to A.F. Losev [2].

In the Age of the Enlightenment scientists were attracted by the society's spiritual development level. The historical process of the mankind development in general was considered to be a process of cultural advancement of a person and the entire social system.

The issue of the individual spiritual development, spirituality formation has always been in the center of the Russian pedagogical idea and Social pedagogical practice.

According to schoolmasters, spirituality is an individual, inward orientation of a person that reveals itself in the unity of intellectuality, ethics, esthetics and creative experience. It is spirituality that represents the highest unseen spiritual center surrounded by and consisting of the entire essence, the entire reason for existence. This idea was especially supported by the Russian Diaspora representatives including schoolmasters, philosophers and the clergy: P. Bitsilli, S.I. Hessen, M.L. Hofmann, E. Elachich, A. Elchaninov, L. Zander, V.V. Zenkovsky, etc.

Character does not develop on its own, its self-enrichment and socialization are closely associated with the social realm. The Russian schoolmasters were upholding the idea that spirituality, being aimed at social experience and value world created by the mankind, stimulates

the appearance of spiritual needs potentially unlimited in the aspect of their satisfying. The more needs there are, the richer the character, the more various are the public relations, the more efficient is the searching for the meaning of life. The spirituality itself is a life-purpose view of a man existence.

Problematic of the character spiritual development was studied by M.S. Kagan, N.A. Koval, A.F. Losev, A.G. Spirkin, V.I. Tolstykh, V.G. Fedotova, T.V. Kholostova, etc.

Considering the width of the problematic different scientists approach the meaning of the spirituality from different points of view. For example, M.S. Kagan defines spirituality in his concept as "an integral unity of transforming, cognitive, social and integral attitude of a man to the world"[3].

I.V. Siluyanova deems spirituality as a method of life activity and gives it the following definition: "spirituality is the capability of a man to consciously control themselves and their behavior, to govern their activity" [4].

As N.A. Koval says "Spirituality might be defined in fact as a deeply personalized human method of the reality reflection and acquisition, determined by the knowledge and activity of a man targeted at superior life and culture values, basing on the ideal of balanced, free and harmonious growth of a man as a concrete historical unity of the general and the unique. According to N.A. Koval the spirituality is "that inward orientation and corresponding life that gives the highest dimension, the most important meaning and value to a human life and all the culture" [5].

There is no any unique definition of the spirituality in the modern science. It may be explained by the width of the problematic itself on the one hand and by the variety of the research methods on the other hand.

In regards to the structure of the spiritual growth of a man there can be defined 3 basic components of the spiritual growth: cognitive, moral and aesthetic.

Each component is a complicated unity of features and elements. For example, the cognitive component includes the knowledge, cognitive methods, ability to understand a situation through spiritual values, ability to reach the meanings of events, understand their reasons and consequences, define the most important.

It is the knowledge deemed not as an absolute givenness but as a product of spirituality that plays the leading role in the cognitive component.

The moral component is represented by the rules of spiritual behavior controlling private and public interests, relationships between a personality and the surrounding world in a way to provide the private and public commonwealth. A person's attitude to the public commonwealth as the target is characterized by such concepts as friendship, solidarity, brotherhood.

The attitude to the private commonwealth as a target is revealed through such values as humanity, humaneness, concern (social altruism), that is non-material relationships. These values when used by a person in their spiritual behavior provide the highest private or public meaning aiming to maintain the harmony of a personality and society as the condition of their well-being. The emotional intelligence and expression of this meaning must be the conscience that only a human has.

It is not just every person but the mankind in general that realizes the spirituality as an independent value.

The aesthetic component in the spiritual growth structure is the perception of life as a value, enjoyment of values, ability to understand the beauty in the surrounding world through aesthetic experience (feelings), aesthetic evaluation based on the aesthetic experience and the standards of beauty, aesthetic sense, aesthetic attitude in practice.

A special role in the aesthetic component formation belongs to culture and art as ways of an individual spiritual self-improvement. The arts intensify imagination, sensibility and sensitivity.

Therefore, cognitive, moral and aesthetic values form an axiological core of every person's life while uniting and integrating one in another.

Today in the times of the market economy the priorities are quite different in our society. The material values in all fields of life dominate over the spirituality growth making the spiritual values move aside giving more space to material values and personal benefits.

The way a child lives, their thoughts and feelings form their personality. Taking into account a child's high sensibility, this process is a lot more efficient than that of an adult. Any gaps in education are ir-

retrievable for any person. That is the reason why it is extremely important to form the spiritual culture during school age.

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THE SOCIAL SECURITY PROBLEMS SUFFERED BY OFFICERS OF THE INTERNAL AFFAIRS AGENCIES.

Аннотация: В статье рассматриваются проблемы социальной защищенности сотрудников органов внутренних дел Российской Федерации, основные направления развития социальных гарантий для указанной категории лиц, а также зависимость между уровнем социальной поддержки и эффективностью служебной деятельности сотрудников органов внутренних дел.

Ключевые слова: Сотрудник органов внутренних дел, государственные гарантии, компенсации, социальная защита.

It is well known that what happens in the Internal Affairs Agencies influences the operational efficiency of all the systems of the Home Office. There is now a significant gap between the level of financial security of police officers and their level of achievement in the force.

The work load that has been placed on the professional staff of the department of Internal Affairs Agencies has been caused by a significant increase in crime levels. This has ultimately resulted in a lessening of law enforcement. The imperfections of the current legislation, putting social security obligations onto the officers of the Internal Affairs Agencies, and the ineffective implementation of those obligations, increases the problem of social protection of police officers. Consequently the improvement of existing law and of social security for Home Office officers is an essential task.

The social security of Home Office officers is a socially and legally binding system constructed to meet staff's physical and mental needs. The social security of the Russian Federation's officers is an essential element in maintaining their legal status. The efficacy of law enforcement depends upon improving social security for the State's officers.

Most problems connected with officers' dissatisfaction with their social security stem from their lack of legal support when making claims.

The basic laws and regulations that define the social security regime of the State's officers are the Federal Law of the Russian Federation dated 07.02.2011 No.3 "On Police" and regulation No. 4202-I "On service In Internal Affairs Agencies" dated 23.12.1992.

It should be noted that a lot of regulations regarding social security are directly related to the social security of Internal Affairs Agencies' officers. As is stated in the Russian Constitution, the Russian Federation is a social state in which policy is aimed at creating conditions for a dignified life and human development. But there is only one constitutional regulation that has a direct relation to the problem of the State's officers.

Social security can be studied in different ways. Generally social security can be defined as an aggregation of various legal arrangements that provide people with a dignified life and the potential for development. Legally, social security is defined as a complex system of measures that creates the liberal and correct implementation of legal rights, which includes judicial protection, along with legislative, economic, organizational and technical methods and actions, as well as citizens' legal ability to defend their rights. Social security in its

narrowest sense is a special social State policy that seeks to provide a legal framework that creates at least a comfortable existence for those groups in the population who are in a particularly difficult financial situation and who are unable to improve it without external support.

The problems connected to social policy regarding the Internal Affairs Agencies are reflected at one level in officers' social security. Officers often become the object of attacks by criminals. In this situation the reinforcing of the social security rights of the Russian Federation's Internal Affairs Agencies necessitates creating the right conditions for officers' professional activities.

The analysis of regulatory laws leads us to the conclusion that major benefits and guarantees and restitution for the State's officers must be established.

The social guarantees given to police officers by the state include the following: they have a bonus system to determine their pay for the work they do, they have a clothing allowance, and they have a food allowance, or money in lieu thereof, they have health insurance, and they are given medication when required, the State insures them in case they are killed or injured or their property is damaged during the course of their work. They are also insured in the event of their becoming ill or disabled in the course of their work.

The calculation of benefits, additional payments and compensations often do not meet the requirements that they must meet. The payment system ignores a lot of factors that influence or can influence the life and health of a police officer. Grounds for compensation must be proved or disproved. I suggest that the European system, which is better, should be implemented. First, solve the problem that is under consideration, then rigidly adhere to the rules and regulations that are legally binding. Then there should be absolute certainty in all circumstances, *de jure* and *de facto*.

As far as health matters are concerned, this problem needs clarifying. Calling on the letter of the law with respect to regulations regarding free medical care necessitates promptness and a high degree of medical skill. Good documentation can help. It's also necessary to increase the standard of all aspects of medical security for officers. Therefore the first step to take is to be fully committed to the well-being of the State's officers, both in word and deed.

The Russian government determines the pay of the State's police officers. That pay includes the official fixed salary, an extra allowance for years of service, salary for the rank achieved, and extra perks and additional payments.

Additional pay is given to State police officers in the following circumstances:

- for using their transport for work purposes.

- for working overtime.

- for standing in temporarily for an absent officer.

- for knowing a foreign language or acquiring a science degree.

Those officers who acquire such distinction are awarded a badge of "Honored Officer of the Russian Federation's Internal Affairs Agencies".

- Extra vacation is given to officers who perform well.

- Those who teach are given books.

- When on business, expenses are paid.

The renting of temporary residential premises is paid for by the State.

When a State officer is nominated for a full time job he/she is entitled to allowances. When they finish working, their entitlement ends. Plain clothes officers are given a clothing allowance. State police get free health care and free medication. The officer's (husband, wife, young children) have a right for compensation in the 50% size of average voucher cost.

State obligations are offered to the families in the case of police officer's death, associated with performance of his professional activities or in the case of his death before the year is out after his dismissing due to wounding or illness which were got during service period.

As an additional security for life and health safeguards, an obliged personal insurance is exercised by the state. In the case of killing or death of insured party either during service period or before the year is out after his dismissing due to wounding, injuries, contusion, mutilation or illness which was got during service period amount of insurance equals to 25 rates of pay on every family member. When incapacity for work of first, second, third groups is determined payments run at 75, 50, 25 rates of pay respectively. When hard or light mutilation (wounding, injuries, contusion) is got amount of payment

equals 10 and 5 rates of pay. Besides taking into the consideration particular conditions of service, annual holidays with pay that last 30 days without passage time record to holiday destination are afforded for police officers. Additional holiday depending on a term of service (after 10, 15, 20 years of service) is afforded for 5, 10 and 15 days respectively.

Professional units of the Internal Affairs in the case of killing or death of a police officer in the result of accident, disaster, violence connected with his service or performance of his official duties give information to the Human Resource Agency of Home Office about family and relatives of the died who were on his maintenance. It should be noted that in spite of some changes in existing legislation, a set of privileges and compensations forming law and social basis for state obligations in the mechanism of defense of rights and law interests of the officers of the authorities of the Internal Affairs is determined.

All in all we can state that a social security of the officers of the authorities of Home Office is a state under which officers of the authorities of the Russian Federation as well as his family members are protected by the state. They can realize their rights in social and cultural sphere; satisfy their mental and material needs at adequate level of social and economic development.

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НАУЧНОЕ ИЗДАНИЕ

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**Материалы международной заочной научно-практической
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